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ADDRESS.

MEMORIAL ADDRESS ON THE DEATH OF DR. I. N. QUIMBY,

CHAIRMAN OF THE SECTION ON STATE MEDICINE,

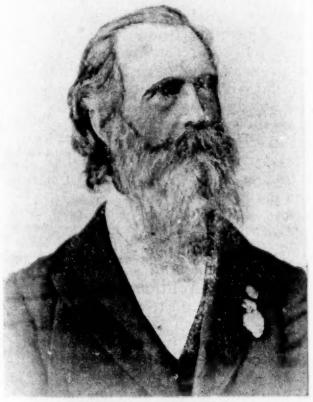
BY CHAS. H. SHEPARD, M.D.

CHAIRMAN PRO TEM.

BROOKLYN, N. Y.

The loss of our Chairman, Dr. Isaac N. Quimby of New Jersey at a time when we were expecting so much from him, is a heavy blow.

Dr. Quimby was one who impressed all favorably at first sight, but a closer acquaintance more distinctly revealed his noble qualities. His genial manner and forcible way of presenting whatever he had to say, whether in public debate or in the private circle, won for him a host of friends.



ISAAC N. QUIMBY, M.D.

Born Aug. 5, 1831, and educated in New Jersey, he early turned his attention to the medical field of his native State, graduating in 1859, from the University College of New York, the second in his class, with a special certificate of honor. Upon the breaking out of the Rebellion Dr. Quimby entered the army as a volunteer surgeon, serving with Gen. McClellan's forces in the Chickahominy swamps. He was at Harrison's Landing, and at Antietam, remaining with his division until after the battles of the Wilderness, when on account of illness he returned home, and shortly after resumed his medical practice.

His experience eminently qualified him to fill a lectureship in the spring course of the University Medical College in 1866-68, and also as assistant to Prof. A. C. Post, in his surgical clinic. Soon after, his activity found vent in the establishment of the Hudson County, now Christ's, Hospital, of which he was the originator in 1868, and he continued as its surgeon until 1873, at the same time being one of the attending surgeons of the City Hospital, Jersey City.

His membership in the AMERICAN MEDICAL ASSOCIATION, and as one of the Judicial Council, was marked by a broad and liberal spirit that gave him a large popularity, and nearly landed him in the presidential chair. His visits abroad as a delegate from the AMERICAN MEDICAL ASSOCIATION, to the International Medical Congress in London, in 1881, again to Copenhagen, in 1884, and at Rome, Italy, in 1894, added to his ripe experience and gave him a large fund of knowledge which made him more useful for the remainder of his days. This same spirit drew him into the membership of the numerous medical societies, including the American Medical Temperance Association, of which he was one of the founders, and its vice president until his death.

His labors in the temperance field were marked by a thorough earnestness. He approached the subject from a scientific standpoint, his experience both in hospitals and private practice confirming him in the conviction that total abstinence from alcohol was the only safeguard for our people. No one was more ready to make sacrifices, either of time or money, for this great truth. With both pen and voice he sought unweariedly to promote this movement, which seemed so important to him.

But of all the causes he espoused, that of scientific temperance education in the public schools throughout our land appealed to him most forcibly as the one foundation of all reforms, in that it commenced at the fountain source. His clear mind appreciated the advantage to humanity which would be gained by having our children taught the facts with regard to the action of alcohol and other narcotics. For five years he was senior member of the medical committee having in charge that noble work of enlightenment, and in no place will he be more missed than in that advisory board. His earnestness, combined with quick perception and fearless action, kept him always in a leading position.

The practical side of Dr. Quimby was shown by the fact that he devised several important improvements in surgical operations, and a number of valuable papers illustrating them are on record. Not alone to the medical field was his work confined, but his public spirit gave him the high honor of being president of the first Citizen's Association of Jersey City, in 1870, which was instrumental in breaking the corrupt official ring which then controlled the affairs of that city. Again, his industry and zeal for the good of his fellow-citizens was marked in exposing and blocking corruption in the State legislature in

1882, and his integrity of character was such as to bring to him the nomination, in 1883, of Governor of New Jersey, by the prohibitionists, which honor he declined.

In the midst of his busy life this great man has fallen, and all of us feel that we have lost a genial friend and a trusted counsellor, who was ever ready to give us of the best that he had. Taken ill on the 29th of April last, his life forces were so exhausted that he could not rally, and in one week he passed to the great beyond. On May 11 he was laid in his final resting-place, leaving his bright example as a valuable heritage to cheer us on in every good word and work.

What lesson has his life left for us? He was sixty-seven years young, for he could not be called an old man. One thing it may teach us: not to be so prodigal of our life forces. It is likely that had he been a little more conservative of his strength he might still have been with us. Let us then study more earnestly those things that tend to the preservation of life and the prevention of disease, which our Section so nobly represents. Preventive medicine, as we understand it, leads to the prevention of the use of medicine by advancing along sanitary lines, with such care of the body and its environments that disease will be prevented, and the use of medicine rendered unnecessary.

This work is committed to our hands, and let us realize that it is not for today alone that we plod, but as the movement passes along to succeeding generations it will gather increasing force and become a blessing to millions yet unborn. Thus shall we aid in the great work of humanity.

By all means let us have a Department of Health.

ORIGINAL ARTICLES.

ABOULIA IN RELATION TO HYSTERIA.

Presented to the Section on Neurology and Medical Jurisprudence, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., July 7-10, 1898.

BY L. HARRISON METTLER, A.M., M.D.

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CHICAGO.

That hysteria is a cerebro-spinal neurosis is now an accepted fact. In its many neuromimetic manifestations it presents both a psychic and a purely neurotic front. It is a mental trouble, but has associated with it at times undoubted sensory-motor disturbances. Sir James Paget used to say that the hysteric exclaims, "I can not;" that it looks much as if it were "I will not;" but that in reality it is, "I can not will." This is one of those clever generalizations that cover much knowledge, but still leave much unsaid. Certain paralyses and anesthesiæ of hysteria can not well be attributed to volitional influences, at least in their late manifestations. Something more than a mere oblivion of the will power must be invoked to account for some of the singular phenomena revealed in connection with the special senses. Many of the visceral and vasomotor symptoms are clearly beyond the power of the patient's volitional faculty. Hence, hysteria must be recognized as a double-faced phenomenon. There is a clearly-defined affection of certain centers lower than those that subserve the purposes of mentalization. Hysteria is not entirely an affair of the brain and the will. This fact has introduced much confusion into the study of the pathology of the disease. Can it be possible, in view of this double-sidedness of the symptoms of hysteria, that the latter is really a combination of two affections: a mental (psychic, volitional) and a more strictly neurotic (subpsychic, ganglionic)? Some have so thought, but the distinction is arbitrary, for mentalization is as much neurotic as is any more strictly sensory-motor manifestation.

Without doubt, hysteria is *ab origine* a functional disturbance of that part of the encephalon or cerebral center concerned in the make-up of the so-called faculty of the will. On the other hand, it is equally true that many of the symptoms of hysteria, such as hemianesthesia and anuria, reveal a functional disturbance of nerve centers much lower than those of the cerebral cortex. Therefore, either we have two forms of disease under the head "hysteria"—a cerebral and a spinal neurosis—or we have a general concomitant neurosis of the whole cerebro-spinal apparatus, its manifestations revealing a variety in harmony with the various functional characteristics of the different centers involved; or we have a single disease, a functional disturbance of the cerebral (psychic) centers involved in the constitution of the intellectual faculties (especially the so-called volition) and this in turn affects secondarily the lower or subcerebral centers. The first two views are not as popular as the last. Gowers seems to accept the third view, for he says "it is certain that the disease (hysteria) can only be really cured by the restoration of the normal balance of cerebral function but the secondary disturbance of lower centers (e. g., vasomotor) may at times preponderate over that which can be recognized in the highest, and may be independent in their degree and in some cases apparently (though not really) in their occurrence." My own observations, both here and in Paris, incline me strongly to regard hysteria as primarily a cerebral trouble, an aboulia, and it seems to me that the aphorism of Sir James Paget is in the main correct.

Now, to harmonize this theory of hysteria with the manifestations of the disease in the lower or subpsychic centers, I have for some time past felt that there must be a change made in some of our notions in regard to the so-called volitional faculty. For example, it seems clear enough to me that every case of genuine hysteria (in which category I do not class hysterical manifestations of purely reflex origin) has its start in a disturbance of the will power, but if I regarded the will as a distinct entity, a special faculty with a special habitat, I do not understand how it can *directly* affect the lower, involuntary centers. I can not comprehend how an individual's disturbed will power can bring about a hemianesthesia and its transference. I must reconstruct my old psychologic ideas in regard to the will, or else relinquish the view entirely that the will is at all concerned in the phenomena of hysteria. I can not do the latter, and so I have accepted a theory of the will which seems to me logical, and on the basis of which I see my way clear to an explanation of the phenomena of hysteria.

What is the will and where is it located? Is it, as some of the older psychologists taught, an intellectual faculty, existing per se and having a local habitat in the brain? The will-function has obviously to do with every voluntary organ and tissue in the body, and if it were possible to definitely locate its center, say

somewhere in the fore-brain, much of the confusion now surrounding pathology would vanish. It would then be comparatively easy to understand how this faculty, seated in diseased brain tissue, might emit or receive abnormal impulses from all the organs of the body. Such an explanation would be eminently physical and easy of elaboration. Such an explanation would rest, however, upon an erroneous conception of the prime nature of volition. *The will is not a faculty that emits or receives anything. It is a term, a definition, merely expressive of a choice, the preponderance of a motive, the outward representation of an inward impulse that is stronger than the other impulses.* The manifestation of volition usually terminates in an action, but this action is not the result of the operation of some particular volitional center in the cortex; it is the result of certain ideas or feelings (impulses) which preponderate at the time and so involve more or less the whole sensory-motor apparatus. In the language of Ribot, "voluntary activity appears to us as a stage in that progressive evolution which proceeds from simple reflex action, where the tendency to movement is irresistible, to the abstract idea, where the tendency to action is at the minimum." The will is thus merely a consciousness of a kind of internal, mental reflex. Mind is made up of sensory-motor activities, real or representative. On the one hand, a vast quantity of afferent impulses, pouring in through the various avenues of special sense and being stored up in the brain by means of heredity in the race and simple memory in the individual, interweave themselves into latent ideas and feelings. These latent impulses, awakened into activity by newer incoming impulses, set into play the motor or idio-motor representative centers, which send out efferent impulses to terminate in muscular action. The transitional process that takes place within the brain from afferent to efferent impulse is recognized in consciousness, and is spoken of as the exercise of the will. As I have just intimated, the time of the reception of the afferent impulses that ultimately go to make up the mental world of ideas and feelings and the time when the corresponding efferent impulses that terminate in voluntary action are sent out need not necessarily be the same or even successive. If a voluntary act is performed today (efferent impulse), the preponderating idea or feeling which gives it birth (afferent impulse) may have been acquired years before and have lain dormant in the meanwhile. The essential fact in regard to voluntary action is that it is always necessarily preceded by some idea or motive, and this idea or motive may have been stored up by memory or by heredity years before. The reflex character of the will is the point to be insisted upon. It is made up always of an antecedent and a consequent; the transference of the former into the latter is what consciousness recognizes and denominates the will.

Upon first thought, this reflex theory of the will would seem to banish all notion of its freedom, but here again the error is made that the will is a special faculty, a thing by itself, of which freedom may be predicated. But there is no such entity as the will, and a thing that does not exist can not be said to be bounden or free. The so-called will, let it be repeated, is merely the expression or conscious representation of a set of impulses acting more vigorously at the moment than any other set of impulses. The phenomenon of inhibition illustrates well this conception of the will. Take for example the depressive effect of fear. A child learns by observation when its guardians are angry with it. It sees the raised hand and the frown on the face. It learns to associate these signs with punishment and pain (afferent impulses). The memory of pain (latent impulse) awakens a mental state in which certain intended actions are inhibited (efferent impulse). At times these awakened memories (latent impulses) of pain are overridden by others (also latent impulses) more powerful, such for instance as some strong feeling of pleasure expected of the intended action, and as a result the desired inhibition does not obtain. In the latter case the child does what it wanted to in spite of the threatened punishment. The afferent impulse which awakenened in memory the idea of pleasure in connection with the intended action was stronger than the afferent impulse which was associated in memory with the idea of pain. Hence the efferent impulse represented by the child doing what it intended to do was different. It looks as though the child willed differently; in reality there was merely a conscious transference from one action to another in accordance with the relative strength of the preceding motives (afferent impulses).

A burglar fears the law to a certain extent and his memory of punishment, acquired by instruction or by actual experience, inhibits him so much in his acts that what he does he does by stealth and under the cover of darkness. If the motive for burglarizing be much stronger than his fear of punishment he will be less restrained and bolder. His mental inhibition will be overcome by his mental avariciousness. This mental conflict, this internal struggle between motives of various strengths, these motives having all been acquired some time previously through the special senses, terminates in some corresponding form of action, and to the onlooker from the outside it appears as though the man had merely exercised some faculty, the will, in deciding to act as he did. Two latent impulses may at times neutralize each other and we say of them, the individual will is paralyzed. A burst of anger, for instance, may be made to suddenly vanish by a recollection of a terrible accident to the victim of the anger.

In all these instances the actions of the individual are "willed" in accordance with the predominance of this or that motive; but the "willing" process is not the result of an action on the part of some special faculty seated somewhere in the frontal lobe and directing this muscle or that organ to functionate. The will is, therefore, psychologically at least, "an individual reaction," and "that which is inmost to us."

"The ego, albeit an effect, is a cause and that in the strictest sense." "To sum up, we have seen that from the lowest reflex action to the highest act of will, the transition is imperceptible and that we can not say precisely where volition proper, that is the personal reaction, begins. The difference is the most pronounced at the two ends of the series: at one end extreme simplicity, at the other extreme complexity; on one hand a reaction that is ever the same in all the individuals of the same species, on the other a reaction which varies according to the individual. Simplicity and permanence, complexity and change are here paired" (Ribot). In the consideration of hysteria and its management this conception of the will is of immense importance and throws light upon much that has heretofore been dark.

This conception of the will involves the idea of a

reflex, or as Ribot expresses it, a reaction. Aboulia means, therefore, a paralysis of the psychic or mental reflex. According to the latest physiologic data, the cortex is as much peripheral in relation to the centers of subconsciousness as are the integument, muscles, etc. An impulse originating in the cortical motor area is *reflected* through the lower subcortical ganglia and anterior cornua to its appropriate muscle just as much as though it had been reflected from some point in the skin around through the anterior cornua to the corresponding muscle. We are all familiar with the reflex picture presented when some portion of the body comes unexpectedly in contact with a hot iron. The reflex picture produced by an awakened sensory area of the cortex is just the same, though not as apparent as the former. Let me illustrate: Suppose I move my arm. The older psychology would say that such a movement being voluntary, originated in some special volitional faculty. Upon a moment's reflection I think it will be seen that such a movement of the arm, though originating in the cerebral cortex, is as much of a reflex as if the same movement had been produced by touching a hot piece of iron. The only difference is, that consciousness is *immediately* cognizant of the former reflex. When I "willed" to move my arm, I did so from some motive, else there would have been no movement. Inertia is as much a law of the mental as of the physical world. In analyzing the motive that caused me to move my arm, there is found underlying it some previous sensory or apparent impulse which may have immediately preceded the movement or have been stored up in memory a long time before. Some discussion I may have had with a friend about the movement of my arm, or some desire I may have had to show my prowess, which desire may have been originally implanted in me by some one praising or criticising me; or any one of a thousand different reasons may have led me to move my arm. I certainly had a motive for moving it at all, and that motive was created out of some influence from the outer world exerted upon me through one or more of my special senses at or prior to the moment when the arm was moved.

Suppose I touch a hot iron and then in spite of the pain, keep my hand on the iron. Is not that a pure voluntary act in direct opposition to a reflex? No; in such a case the cortical reflex is merely stronger than the cutaneous. Why do I keep my hand on the heated iron in spite of the pain? Simply because I have a motive for so doing. That motive may be the love of praise, emulation or experimentation, but whatever it is, it is based upon some previous sensory impulse poured in upon me from the outer world. Those impulses have been received, and if they have been latent, have been stored up in the sensory cortex. The matter may be formulated somewhat thus: No motive, no voluntary act; no sensations, no motive; hence all voluntary acts are in their last analysis referable to prior sensations and the so-called will is thus shown to be a sensory-motor reflex.

I grant this does not leave much room for the idea of a "free will," but it appears to me as a most rational explanation of volition, which in its final analysis proves to be merely the personal reaction of the individual to past and present impulses. The "wills" of different individuals, or their personal reactions differ just as the sensibilities of all mere protoplasm, the amebæ, for instance, differ in their response to external irritation. If this explanation of "will" be well understood, much can be made clear as to the nature and treatment of hysteria.

We call hysteria a neurosis, a neuromimesis. In its typic form it seems to be a rational disorder, almost an aboulomania; yet there are symptoms, as I have said before, that seem to lie outside of the influence of the will. It is both a psychic and purely neurotic disease. Psychosis and neurosis are, however, the same. Mind is made up of sensory-motor phenomena or their cortical representation. I have endeavored to show that "will" especially is merely a sensory-motor reflex, and, therefore, hysteria from every point of view is simply a neurosis. It is a neurosis of the cerebro-spinal system involving its great sensory-motor reflex function. In idiopathic hysteria it is the higher arc, the cortical reflex arc, that seems to be affected; in hysterical manifestations due to extra-neurotic lesions it is the lower or subcortical reflex arc that is involved. The reflex character of the hysterical manifestations caused by a diseased ovary are obvious enough at times, but while not so obvious, nevertheless just as much of a reflex is the hysteria produced by cortical trouble such as may have been produced by bad heredity, bad education, bad discipline and other factors that enter into the making of the individual's character, *his personal reaction*. We say a hysterical patient's will-power is at fault; as a fact, however, her higher sensory-motor reflex apparatus is at fault, and she does things and reveals symptoms because certain bizarre impulses have taken the place of more rational and appropriate impulses. The trouble may be entirely on the sensory side of the arc, and in most cases it is; then, in conjunction with the various anesthesias, there may be complete absence of choice between motives or complete non-volition (aboulia). Again, the impulse from the sensory side of the arc may be so feeble as to awaken only the feeblest sort of a motor response (partial aboulia). Thirdly, the impulse from the sensory side may be so abnormal and extraordinary as to terminate in the strangest sort of movements (aboulomania). A hysterical patient, therefore, may exhibit sensory or motor paralysis (volitional) from mere absence of appropriate sensory impulses, or from two or more sensory impulses conflicting and neutralizing one another; or, she may reveal the strangest sort of motor symptoms and assume attitudes (for sympathy and effect, we say) because her motives (sensory impulses), past and present, have been unnatural and inappropriate. Illustrations of all these conditions will readily occur to any one who has seen much of hysteria. Therefore, I think we can safely say that hysteria is a neurosis involving the great sensory-motor reflex function of the cerebro-spinal apparatus; that the typic form (aboulia) is a disturbance of the higher (cerebral) sensory-motor reflex as much as are the hysterical symptoms caused by a disturbance in the lower (spinal cord, ganglionic) sensory-motor reflex arc. Being a neurosis, involving all the cerebro-spinal reflexes, it is easily seen why hysteria should mimic all organic diseases involving the same reflex arcs.

From the above standpoint, the treatment of hysteria becomes plain. In the lower form of the disease all extraneural sources of irritation should be sought for and removed so as to restore the integrity of the lower reflex arcs. In the higher form, a new set of different impulses and new motives should be

awakened so as to restore the equilibrium of the higher or cortical sensory-motor reflex arc. Of course, heredity is a tremendous obstacle to overcome, but is not altogether insurmountable. Given, therefore, all measures to restore the physical condition, nutrition, etc., of the tissues involved, the treatment of hysteria resolves itself into the study and correction of the patient's sensory-motor reflexes. This involves so many obvious details that I will not occupy your time now in rehearsing them.

Reliance Building.

THE RELATION OF NEURASTHENIA TO INSANITY.

Presented to the Section on Neurology and Medical Jurisprudence at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY JOHN PUNTON, M. D.

KANSAS CITY, MO.

The vast increase of our knowledge of the nervous system and its application to disease has been found to be most useful in the correction of certain former erroneous inferences. Hence a complete revolution has taken place in our knowledge of its pathologic states, which has also been the means of greatly enlarging the range of its organic lesions, at the same time materially limiting the scope and significance of its so-called functional affections. In spite of our grand success, however, in unraveling the secrets of the morbid changes in both structure and function of the neuron, much still remains to be done before we can successfully cross the Rubicon that separates organic lesions from those that are of purely functional origin.

This uncertainty of our knowledge has led to the formation and maintenance of a false system of nomenclature which not only confuses but greatly hinders the progress of scientific nosography. Hence many terms have come into general use which at the time of their advent were very convenient screens to shield our ignorance, but as our knowledge increased the scope of their power and significance was greatly reduced and limited, until today a larger and fuller knowledge renders many of them futile and actual misnomers. Others again embody a generalized morbid state or condition which later investigation renders capable of scientific classification, thereby greatly limiting their former power and significance, and unless the physician is fully aware of the changes wrought by such advance, he is greatly handicapped in his interpretation of the term, and his skill in diagnosis proportionately suffers. In no branch of medicine are such mistakes more common and conspicuous than those found to be associated with lesions of the nervous system. Nor is this strange when we remember its complex mechanism and the difficulty experienced in mastering the details of its scientific study in health and disease.

One of the most striking and widespread examples of mistaken identity in the true interpretation of the significance of the term is found associated with the morbid condition designated as "neurasthenia." I doubt if there is a more common and serious affection of the nervous system that is more generally misunderstood by the profession at large than this *fatigue-neurosis*. It is surprising to find the gross indifference manifested on the part of many physicians toward its real nature and character. Not only do they treat neurasthenia carelessly, but they refer to it slightingly, and imply both by word and conduct that they believe the patient to be a malingerer, and that his sufferings are entirely false and even conjured for the occasion. It will, therefore, be the purpose of this paper to try and correct such erroneous inference as well as place it upon its true scientific basis.

The term "neurasthenia" was supposed to have been first used by Dr. Beard in describing a general morbid weakness or exhausted state of the nervous system. Later investigations, however, prove that his claim to priority in its use was an erroneous one. To Dr. VanDusen belongs the credit of using it as early as 1867 in his valuable paper entitled "Observation Upon a Form of Nervous Exhaustion, or Neurasthenia Culminating in Insanity," which appeared two years earlier than Beard's famous monograph. It has since been shown, however, that neither of these physicians invented the term, as it can be found in Dunglison's Medical Dictionary published in 1833. Notwithstanding these facts, the medical profession is under lasting obligations to Dr. Beard for the persistent manner in which he emphasized the importance of its study, thereby acquiring for himself an enduring monument in medical science. Prior to his labor in this direction, much confusion prevailed in the interpretation of a large group of symptoms which were fundamentally dependent upon a morbid weakness of the nerve centers, but which had been previously ascribed to disease of the various visceral organs involved, such as perverted conditions of the kidney, liver, stomach, uterus, etc. The result of Beard's work, however, led to a more thorough systematic study of its pathogenesis, which is still in progress, and the conclusions so far reached warrant the assertion that expresses an affection which does not limit itself to any part of the nervous apparatus, but affects it as a whole. Hence it is an extremely generalized condition, and often associated with other functional and organic diseases.

Its extremely generalized character may therefore affect the brain, spinal cord, peripheral nerves, the visceral organs, and indeed all parts of the human organism subject to nervous innervation. Consequently its symptomatology is exceedingly extensive and varied. This wide range of involvement has led to much confusion and is the responsible agent for the vague, ill-defined notions entertained by many concerning the true nature and character of neurasthenia; some physicians even going so far as to deny its existence altogether as a clinical entity. Laying aside all controversy, the consensus of opinion today by those most competent to speak declares that neurasthenia in its quintessence is a true fatigue neurosis characterized with an increased morbid reaction of the ganglionic nerve centers to all kinds of impressions, both mental and physical, whether slight or profound; producing an excessive nervous weakness and nervous irritability, which constitute its chief cardinal symptoms. Moreover, recent investigation demonstrates that while the various symptom groups occurring in neurasthenia are numerous and differ widely in detail, yet there are always present certain essential features that constitute a well-defined clinical syndrome. These have been termed by Charcot as neurasthenic stigmata.

All authorities agree that the cardinal symptoms of neurasthenia present well-marked evidence of weakness and irritability of the nerve centers which in themselves are expressive of fatigue. Weakness and

irritability of the nervous mechanisms that preside over the various bodily organs are, therefore, the chief clinical phenomena, belonging to any and all varieties of neurasthenia. These may present themselves in all degrees of intensity and are usually accompanied with other symptoms which denote the particular functions of the nervous system that are involved. Hence we may have involvement of the motor, sensory, reflex, trophic, secretory, visceral and psychical mechanisms which furnish a wide and varied range of clinical phenomena. But it matters little what part of the nervous apparatus is included in the pathologic process, the two dominating factors that are present and common to all varieties, and that which defines neurasthenia as a separate and distinct clinical entity are weakness and irritability of the various nervous functions involved. They are, therefore, properly regarded as the essential primary or fundamental symptoms of the lesion while all other associated clinical evidences of involvement are termed secondary or adventitious symptoms. These latter may be the outgrowth of the former and are simply parts of a well-defined harmonious entity.

Neurasthenia, therefore, presents two great classes of symptoms, viz: primary and secondary or adventitious, which may affect both the physical and mental constitution in varying degrees of intensity. The skill of the physician, therefore, in its diagnosis depends upon his ability to differentiate the one from the other, and upon this largely hinges the prognosis. Moreover, neurasthenia is variously classified by different authors according to its etiology, symptomatology or the apparent seat of lesion. Hence we may have cerebral, spinal, traumatic, sexual, toxemic, reflex and many other forms of the disease. While no doubt this method has some advantages, yet it often proves very confusing and misleading.

A classification that recognizes neurasthenia in its entirety is to my mind, therefore, much preferable, and from this standpoint it can be reduced to two classes, viz: 1, complicated; 2, uncomplicated neurasthenia. In the former it may be found associated with many functional as well as organic diseases, such as epilepsy, syphilis, malaria, gout, rheumatism, uterine disease, hypochondria, sexual perversion, insanity, as well as many other morbid conditions. In the latter it presents itself by a conspicious absence of any such complications, in which case it is known as simple or uncomplicated neurasthenia. The effects of either class, however, produce symptoms which may be referred to both the physical as well as mental constitution of the individual, and present a wide range of clinical phenomena that are, for the most part, subjective in character. While it is true that much speculation has been indulged in relative to its pathology, we are still compelled to admit that so far we are unable to positively declare what the actual changes of the nervous elements are in neurasthenia.

The two important symptoms, viz: morbid irritability and morbid weakness of the nerve centers, have been shown by Hodge to be due to changes in the nerve cell itself, and that the lesion of fatigue is loss of cellular substance involving the nucleus, protoplasm and even the capsule itself. According to Dercum, this waste of nerve substance had been demonstrated by Mosso to alter the constitution of the blood, producing a true toxemia that strongly inhibits the physiologic action of the nervous elements distributed to the voluntary muscles and other organs of the body. Let this be as it may, it is certain that the element of autotoxemia enters largely into the production of neurasthenia, and often gives rise to tissue changes that are commonly found associated with its more severe forms. The continued results, however, of nerve strain from any cause, that form so prominent a factor in American business, social, political, and professional life, operate upon the physical and mental organization in such a manner as to exhaust strength or vital force more rapidly than recuperation takes place. Consequently nervous exhaustion or neurasthenia ultimately ensues. More especially is this found to be true of persons inheriting a neurotic diathesis, as this renders them more susceptible to the baleful influences of the common causes of neurasthenia. Excess and abuse, of any and all kinds, with faulty methods of living, operating upon such an individual are recognized by all authorities to be potent factors in the production of neurasthenia. Dana claims that the causes of neurasthenia can be reduced to two agents, viz: bad heredity and foolish living (*Twentieth Century Practice.*)

The reduced nervous energy that results from such causes seriously affects the visceral organs and nutritive functions of the body, which is expressed clinically by a marked weakness or inaction as well as want of vigor of all the bodily processes. A feeling of bodily illness is thus engendered that attracts the attention of the patient to himself and ultimately forms the basis of morbid fears or nosophobia. This again leads to the development of despondency, petulance, irritability, selfishness, impatience and vacillating conduct, all of which are marked features of the formative or incipient stage of insanity. All authorities agree that incipient insanity is attended with physical and mental changes that are indicative of nervous exhaustion, and that clinically they are expressed by a dimunition or want of vigor of all the bodily processes. Moreover, despondency and nervous irritability are also marked features of early insanity.

The relation of neurasthenia to insanity, therefore, cannot be overestimated; indeed the relation one bears to the other in a large number of cases is so very close as to almost establish a true equivalency. Kirchoff has clearly shown that certain insanities, such as melancholia, mania, paranoia and paralytic dementia may develop upon a neurasthenic basis, while Chapin, in his recent work on Insanity, just published, also declares that the larger proportion of hospital admissions received in an acute stage of insanity have a history of neurasthenia. He therefore fitly styles it the "soil out of which insanity develops." Unfortunately, too often the close relation that exists between neurasthenia and insanity is entirely overlooked and even ignored. Consequently many a curable case becomes incurable by failure on the part of the physician to recognize its true nature and character. Moreover, its close relation to hysteric states often leads the physician to treat it with contempt, under the mistaken idea that the barometric changes from day to day indicate a fraudulent basis. Nothing could be further from the truth, as there is plenty of evidence in every genuine case of neurasthenia to explain its fluctuating tendencies even in its most simple and uncomplicated forms. One of the most important signs of neurasthenia becoming complicated with mental disorder is the manner in which the feelings, thoughts and actions of the patient absorb his entire attention. This self-consciousness

is a marked feature of many forms of neurasthenia and betrays the serious invasion of the higher mental faculties in the progress of the malady.

These concepts have been variously designated by different authors as obessions, impulsions, imperative concepts, besetments and fixed ideas. They usually consist, however, of a general feeling of anxiety, which amounts to morbid doubts and fears that later lead to impulsive acts. They irresistibly force themselves upon the individual, dominating his every thought, word and deed. In their more severe forms they constitute the various phobias, but as they present themselves in all degrees of intensity, it is the degree combined with their persistency that indicates their true seriousness. For convenience of study Regis (See Manual Mental Medicine, p. 262) has divided them into three classes, viz: 1, those characterized by indecision, of which all kinds of morbid doubts are typic; 2, those characterized by all kinds of morbid fears; 3, those characterized by morbid propensities or irresistible tendencies. Each of these is again subdivided. For instance, Ball has divided the first class, or doubters, into five subdivisions, according to the nature of their predominating ideas. Hence we have: 1. "The metaphysicians, who are especially haunted by abstract questions of all kinds, such as doubts concerning heaven, hell, the world, the deity, etc." 2. "The realists, who constantly revolve in their thoughts the lower and base details of objects, such for example as the conformation of the genital organs, copulation, etc." 3. "The scrupulous, whose doubts pertain to forms of religion, such as accusing themselves of committing the unpardonable sin, or of some theft, etc." 4. "The timorous, who are fearful of committing some indelicate action by even allowing their clothing to come in contact with that of others, etc." 5. "The counters, whose doubts are manifested under the form of irresistible enumeration." Such patients never get through counting different objects, such as door knobs, the houses on the street, or their numbers, etc."

The second class, or those suffering from morbid fears or phobias, is divided into three subdivisions:—1. those who have a morbid fear of all kinds of objects. Its expression is extremely varied, and may involve such articles as glass, knives, pins, guns, thunder, flowers, besides certain kinds of food and drink. 2. Those who have a morbid fear of places, elements or diseases. Such patients are morbidly fearful of high places, bridges, streets, churches, theaters, rivers, beside a dread of all kinds of diseases, such as heart disease, liver disease, cancer, etc. 3. Those who have a morbid or irresistible propensity to steal, lie, cheat, drink, blaspheme, set on fire, or abuse the sexual organs. All of these various states are ably shown by Regis to be due to lesions of the will and are often associated with neurasthenia.

In a limited degree they are commonly present in health; indeed very few of us escape the presence of doubts, fears or impulses as isolated sudden thoughts, but which are controlled by the dominating power of inhibition. For instance, it is a common experience for persons looking from a height to be tempted to jump down; or in walking on the street are suddenly siezed with a desire to count the houses or numbers on the doors, etc. But these sudden impulses are easily resisted or controlled, but when they appear as a complication of neurasthenia, they are often morbidly persistent and get beyond the control of the will. In their exaggerated forms, they therefore constitute a serious symptom and may become the dominant feature of a grave form of insanity. In all cases, however, where their presence can be demonstrated, they are to be regarded as marks of true degeneracy, often remaining latent for years, to be brought to the surface by some sudden or severe shock to the nervous system; such as trauma, or severe mental and physical strains, beside excesses of all kinds. That such states also often accompany insanity is generally recognized, but I repeat it is their intensity combined with their persistency that indicate their true seriousness. Moreover, there can be little doubt that certain crimes are due to such sudden impulses which arise in the minds of persons who are not ordinarily regarded as insane, and which the subjects are wholly unable to resist. Hence they are truly irresponsible and should be given the benefit of the doubt. From the fact that such symptoms are so frequently seen in both neurasthenia and insanity, the close relation that exists between the two cannot be overestimated. Indeed, all the evidence proves conclusively that neurasthenia in its more profound types presents many symptoms in common with true insanity, and the line of demarkation that separates the one from the other is at times as dimly drawn as that which exists between sanity and insanity, physiology and pathology.

Moreover, the teaching of our text-books in regard to their differential diagnosis is often very misleading, for we are taught to believe that in neurasthenia the morbid fears can be removed by a process of reasoning, and that the patient can be convinced of his mistaken ideas; while in true insanity no amount of reasoning succeeds in convincing the patient of his mistaken notions. If this was taken as a criterion, many a neurasthenic patient would be regarded as suffering from insanity, when as a matter of fact his neurasthenic condition had not reached that extreme degree of mental impairment that is synonymous with true insane delusions although the morbid fears apparently resist all forms of reasoning. It must be confessed, however, that when the morbid doubts or fears reach a certain degree of intensity, combined with persistency, they then often become the equivalent of true insane delusions and should be treated accordingly.

That many cases of neurasthenia become thus complicated is clear to all, and the importance of the close relation that exists between neurasthenia and insanity, I repeat again, cannot be overestimated; indeed it often requires at best much practical knowledge and experience to recognize the appearance of one and the disappearance of the other.

In conclusion I wish to add that in the preparation of this paper I desire to acknowledge my indebtedness to such authors as Regis, Dercum, Dana, Gray, Kirchoff, Clouston, Blandford, Diller and many others, beside cullings from recent neurologic and psychologic journalistic literature.

DISCUSSION.

Dr. MEYER—The daily work in the hospitals for the insane leads one continually to the following dilemma: that we either have to give up making diagnoses and take everything as diffused manifestations of sickness or disease, in which case we would be inclined to let neurasthenia be just one of the initial symptoms of insanity—something that may or may not go over into insanity; or, we can take the plan which I am more inclined to follow for clinical reasons, viz., endeavor to

single out those forms of neurasthenia which we know are initial stages of certain forms of disease, and try to keep those separate and apart from neurasthenia that always remains neurasthenia without ever going over into insanity. Dr. Maclean has made a classification of insanity in which he takes neurasthenia to be the initial symptom of all general insanity, even of general paralysis. If we do that we give up all clinical method. The fact that symptoms in the beginning of general paralysis may be those of neurasthenia, should not induce us to say that that is the same neurasthenia which may exist independently and never go over into general paralysis except after previous syphilitic infection. For clinical reasons, therefore, in working out problems, I should hesitate very much to allow neurasthenia to take quite as broad a field as Dr. Punton gave it. We have to distinguish besides, the simple neurasthenic constitution; then the real fatigue neurosis; then the initial stages of definite forms of disease, such as general paralysis, and such as periodic insanities or any special form of insanity. I admit that it is at present almost impossible to say at the start in certain forms of neurasthenia what it is. I think that it is easy enough to distinguish the constitutional neurasthenia from an acute fatigue neurosis; it is also rather easy to distinguish neurasthenia that is the beginning of general paralysis; but, nevertheless, there will be a great number of cases that will lead us into the habit of looking upon neurasthenia as that diffused field into which we are inclined to throw anything that we can not classify anywhere else.

Dr. H. S. DRAYTON of New York—My first acquaintance with this Protean form of neurosis was derived from reading certain pamphlets by Dr. Beard of New York. I think it is to Dr. Beard that we owe the term "neurasthenia." Some eighteen or twenty years ago he published a volume entitled "American Nervousness," in which he described a train of symptoms that seemed peculiar to American civilization, and a little later he came out with this term "neurasthenia." He described the peculiar category of symptoms which were included under this form as having a particular relation to our American climate and civilization, and since I have heard a good deal about the Denver climate of late I have been wondering whether or not there is anything here that is at all curative of neurasthenia. Now it seems to me that in the effort to make a differential statement so that we can determine at all what there is peculiarly its own in neurasthenia, we might ascribe to that form of nerve disease a capricious category of symptoms; that is, that neurasthenia is indicated more by caprices of habit, caprices of mental expression. The causative factors are to be looked at from the point of view of the individual's heredity and life, as in all forms of nerve disease. Not long ago, Dr. Spitzger, whose name I think is very well known in this circle, delivered a very elaborate opinion with regard to the difference to be drawn between neurasthenia and melancholia, and in a nut shell, he seemed to be of the opinion that most neurasthenic troubles were traceable to specific cause. Looking at the subject from one aspect, that is, the number of cases of young people affected, young men especially affected by neurasthenia, it strikes me from my own observation that the great majority of these causes are found among the comparatively young; so that it may be termed a trouble or affection of those chiefly under 40 years of age. Now, can we fairly discriminate; I might ask, can we draw a very fine line of demarkation between neurasthenia and melancholia? It strikes me that we cannot. From what I have heard from the late reader in that most admirable paper, my opinion is confirmed in regard to the relation of neurasthenia to insanity. Accepting that view, we see the necessary relation to melancholic patients.

Dr. TOMLINSON—The more experience I have in the observation of cases of insanity the more am I confirmed in the conclusion that it is about time to call a halt in multiform classifications and diagnoses, and while we can say that the average case of insanity presents certain physical conditions which have for their outward manifestations the characteristics of neurasthenia, still, at the same time, this is present in all cases of insanity, and there is no difference between the neurasthenic manifestations of an insane person and the neurasthenic manifestations of a person who is not insane. So far as trying to make a relation between them is concerned, it only ends in confusion. While the insane person may in the earlier stages, or may, all through the outbreak of mental disturbance, manifest neurasthenic symptoms, still the neurasthenic symptoms have nothing to do with the insanity, nor does the insanity have anything to do with the neurasthenia. It is a matter of relation rather than of causation. It is not those cases in which neurasthenia is most marked that afterward become insane. The same holds true with regard to the other conditions which are supposed to differentiate forms of insanity, and so far as their practical care and treatment are concerned, in the effort to make a diagnosis and to put this case or that case into a marked classification, this has a tendency to obscure and interfere with our treatment. Furthermore, there is not, so far as I know, any pathologic difference, and we have to go further back in the history of the case to determine just what the significance of these manifestations is. It seems to me it lies in the difference of degree of instability or defect in the individual who becomes insane or neurasthenic, and that we can get a clearer and more definite idea of the subject by recognizing the neurasthenic as representing a certain degree of instability. So long as we do not bear this in mind, the more we try to classify, and the more we try to understand these cases, the more will we become confused. In my own work I have practically given up attempting to make a diagnosis or attempting to classify one case from another, because I see that one case, although it may manifest a certain number of symptoms which might place that individual case in a certain classification, still during the period of the illness or mental disturbance there will be a whole host of other symptoms manifest themselves which would seem to put the case in another category. So, while it may for a time be of interest to classify them, so far as the patient is concerned, it is important to recognize that it does not make any difference what their condition is—what we have to deal with is the insanity, and back of that is the degree of the defect of the individual, and upon the degree of that defect will depend the diagnosis.

DR. HOPPE—I believe that the view which the individual members hold depends upon the standpoint from which they see their cases, whether in insane asylums or in general practice. Personally I have never seen but one case of neurasthenia pass into insanity. I believe that these cases are very sharply divided and identified, and I do not think that the pure form of neurasthenia will ever pass into insanity. For instance, take that class of neurasthenics who have fixed ideas. Their judgment may be wrong in this respect, but in all other respects it is right. It is not so much an error of judgment as it is based upon a fear which can be classed among the photophobias or neurasthenias which occur in those cases of neurasthenia which are constitutional in character and based upon hereditary defects. I believe there is a very sharp line of demarkation between neurasthenia and melancholia. It is true that in neurasthenia we have depressed states; but that in my estimation does not constitute melancholia. I believe that the fundamental idea of melancholia is the idea of self-accusation; that the patient takes some point in his past history, real or imaginary, which he accuses himself of having committed, and which he looks upon as the cause of all his mental pain and suffering, whereas we never see that in the depressed form of neurasthenia.

Dr. ESKRIDGE—I shall have to differ from my friend Dr. Hoppe. I have seen quite a number of cases of neurasthenia pass into melancholia. During the past fourteen years I have been able to follow my cases from the clinic room and the office to the insane asylum, having the privilege of visiting patients there from time to time during that period. I have thus been able to follow a great many cases of neurasthenia. There is a very close relation between neurasthenia and insanity. I doubt very much whether any one can positively say that a given case of neurasthenia will not pass into melancholia. I doubt very much whether anyone cay say with any degree of certainty that this particular case of neurasthenia is not melancholia. A great many cases of melancholia begin with neurasthenic symptoms. Whether that passes into insanity depends upon several causes, but two of the principal are the hereditary condition of the patient—that is the nervous stamina—and the man's hands into which the patient falls. There is certainly a very strong personal element in treating these cases of neurasthenia and beginning cases of melancholia. That person who can inspire confidence; that person who can make his patient feel that he or she is going to get better, whether he is a good physician or not, will have more effect than a second physician who has not personal magnetism. I do not believe that we ought to try to draw a hard and fast line between neurasthenia and melancholia.

Dr. JOHN PUNTON, Kansas City—I have nothing more to say except that I appreciate highly the kind manner in which my paper has been received, and from the remarks that have been made it is evident that we are not altogether settled in our opinions as to whether there is a relation between neurasthenia and insanity or not. As far as I am concerned, my position is the same as Dr. Eskridge's.

A CLINICAL STUDY OF MULTIPLE NEURITIS IN YOUNG CHILDREN.

Presented to the Section on Diseases of Children, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

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The following brief clinical studies of multiple neuritis embrace only those cases in which were found motor and sensory paralysis of symmetric development, but do not include that form of neuritis which affects only the muscles of the palate or of the nose, as shown by regurgitations of fluids, with nasal voice or those cases affecting only the ocular muscles.

Diphtheria is undoubtedly by far the greatest cause of multiple neuritis. Comparatively few cases are caused by the other infectious diseases. Smallpox is not infrequently a cause of the disease, but I have seen no mention made of chicken-pox giving rise to the disease. I, unfortunately, have one case to report of the production of the disease by arsenic given during the course of treatment of chorea. I have twelve cases to report, the causes of which were: arsenic administered for chorea, 1 child; diphtheria, 9 cases; varicella, 1 case, and measles 1 case. Seven children were cured, 5 died. In none of my cases were the sphincters involved; in all cases there were some deviations from the normal mental condition of the child. This last symptom I have seen little stress laid upon. The first symptom noticed was simply a weakness of the extremities, followed rapidly by inability to stand or walk—the motor paralysis appearing first, followed at once by the sensory paralysis, the recovery being first of the sensory and later of the motor paralysis.

No allusion was made in medical literature of paralysis following diphtheria until the end of the 16th century, the first mention being made in 1580. Ghisi, in 1747, describes an attack in his own son, and adds that he "left to nature the cure of the strange consequences." The first description of the disease in America was given by Dr. Bard of New York, in 1771. Few authorities describe multiple neuritis in children, although diphtheretic paralysis was described long before the disease was considered to be a neuritis. In looking over the statistics of paralysis following diphtheria, I find no distinction is made, or in only a few instances, of paralysis affecting the throat only and a general multiple paralysis. In the collective investigation of the American Pediatric Society, of 189 cases, the paralysis was general in 8 only. They report 3384 cases with 9.7 per cent. followed by paralysis. Various other estimates are given of from 5 to 15 per cent. All authorities agree as to the rarity of death, although one authority thinks physicians are too optimistic in regard to the mortality. Of my 9 cases, 3 were treated during the attack of diphtheria with antitoxin; of these three, 2 died. Five of the 9 children were treated during the attackof diphtheria In 7 cases the Klebs-Loeffler bacilli were found; the other two occurred before the discovery of the bacilli. The ages varied from 23 months to 12 years.

Case 1.—Willis S., the youngest child, 23 months, had an attack of diphtheria, moderately severe. One week later there was hoarseness followed by regurgitation of fluids through nose, nasal voice, and internal strabismus of both eyes. At the end of the first week the child was unable to stand alone, or walk, pain over track of nerves, most marked in the lower extremities, anesthesia, as shown by the indifference to prick of pins; the temperature test was not applied; the child lacked its normal intelligence. The symptoms increased rather in extent than intensity, the muscles of the neck becoming involved. The rectal temperature varied from 101 to 104.5, with at the end 106. Death occurred in a spasm at the end of the fourth week from the first appearance of the sore throat.

Case 2.—Joe S., 4 years; seen on the eighth day of diphtheria. Klebs-Loeffler bacilli found, nose, pharynx and tonsils involved, moderately severe attack; throat normal and free from bacilli on the thirteenth day after the first symptoms. Thirty-one days after the first appearance of the sore throat, or eighteen days after recovery from the diphtheria, nasal voice and regurgitation of fluids were noticed, and the child walked with difficulty; this increased in severity, the child became unable to either stand or walk alone, pain on pressure over the nerves of the lower extremity, with anesthesia. The muscles of the trunk and neck were not involved. The child again began to walk fifteen days after the symptoms of nasal voice and regurgitation were noticed, with complete recovery shortly after.

Case 3.—Sara N., had a mild attack of sore throat, according to the history of the mother, from which she recovered. In the fifth week after, nasal voice and regurgitation of food began. The child complained of being tired and disinclined to walk; this gradually increased, and at the end of four weeks she was suddenly seized with pain in all the extremities, and shortly after was unable to stand, walk, sit or hold head up: marked tenderness and anesthesia in all extremities. The temperature test showed great pain when heat was applied, but she insisted that the cold made her feel much better. The tenderness over the track of the nerves was intense; the temperature varied from 101 to 104.5; there was gradual loss of intelligence. Five days after she complained of severe pain, the physical signs of broncho-pneumonia were found; death occurred in the ninth week from the first symptoms of sore throat.

Case 4.—John K., 3 years; recovered from a mild attack of chicken-pox about July 1. On the 7th the child was attacked by laryngeal diphtheria. Antitoxin was given, and the child was completely recovered by July 14; the bacilli persisted until July 31. August 1 the mother noticed the nasal voice and a very slight regurgitation of fluids—on the 7th the child held the head to one side, staggered when attempting to walk, and fell down frequently; four days later was unable to stand alone; anesthesia marked; temperature test showed heat felt over a part of both limbs—of lower extremities, less on upper and on the trunk. Child at times seemed delirious, intelligence very much below his normal, died suddenly, apparently from cardiac paralysis on the eighteenth day after the first regurgitation of fluids.

Case 5.—Mild attack of diphtheria, December 30. Antitoxin given; complete recovery on the eighteenth day. February 7, without previous regurgitation of food, child began to limp, and fell down a great deal, complained of pain in the legs; four days later could walk only by dragging the feet, and at times crossed his legs during locomotion; could not stand nor walk alone; marked pain over track of nerves, with marked anesthesia of both legs; no reaction to cold temperature test. Slight reaction to heat; upper extremities normal; could sit alone, but only a few minutes. On the sixteenth day internal strabismus of the left eye was noticed; on the twenty-first day attempted to walk; twenty days later completely well. The intelligence of this child was less affected than the others.

Case 6.—Annie P., 9 years. Early in November had an eruption on the hands, the nature of which was not known. No attention was paid to this, and about December 1 complained of inability to walk, and regurgitation of fluids and nasal voice. When seen a few days later could neither stand or sit alone; tenderness over track of nerves, patella reflex nearly absent. The symptoms remained about the same for a month, then marked change in the intelligence, utterly unable to move the lower limbs or hold the head up; tenderness over track of nerves much more marked, with marked anesthesia. Entire absence of patella reflex; slight atrophy of lower limbs; could not swallow even solid food without choking. All symptoms continued to increase in severity; intelligence became more affected; there was anesthesia of all limbs and of the throat, as shown by the indifference to the introduction of the stomach tube, this being at first much resisted. The disease lasted from November 1, the time of appearance of the eruption, to January 29, when death occurred apparently from cardiac paralysis.

Case 7.—George Mc., 5 years. In the latter part of March had a mild sore throat; well in a week. One month later child began to behave strangely and staggered when walking. This slowly increased, then nasal voice and regurgitation of food.

In ten days from first symptoms, child decidedly idiotic. Could not sit, stand or walk, even with much assistance. Pain over track of nerves, anesthesia most marked in the lower extremities. Patella reflex absent. On the fifteenth day very slight improvement, which gradually increased and the child was entirely well, with his usual intelligence thirty days later.

Case 8.—Charlie S., 4 years. Diphtheria September 1, moderately severe; treated with antitoxin; made a good recovery. October 5 child became sleepy, some regurgitation of fluids; two days later marked tenderness over track of nerves in the lower extremities; unable to stand alone or walk; four days after the first symptom of regurgitation, child unable to hold head up or sit alone; very marked tenderness over the track of the nerves in the lower extremity, to a less extent in the upper extremities; anesthesia marked over lower limbs, less over upper; in parts of chest and abdomen marked anesthesia; much muco-purulent discharge in mouth and throat; intelligence much diminished; the lungs showed signs of a general broncho-pneumonia, and very numerous pleuritic râles. The patella reflex entirely absent. The anesthesia and paralysis became marked, and death occurred on the ninth day from the first symptom of regurgitation and weakness.

Case 9.—Christine N., 6 years. January 6, mild attack of diphtheria, from which she apparently completely recovered. February 18, feverish and vomited; complained of much pain in both legs and was unable to walk; admitted to the New York Infirmary for Women and Children; absence of patella reflex on both sides; marked pain and tenderness over the track of the nerves, with very marked anesthesia to prick of pins and to the heat test; slight reaction to cold; upper limbs and trunk were normal; both feet extended; neither nasal voice or regurgitation of fluids; child not so bright as she is normally; can not stand alone nor take a step alone. Symptoms gradually decreased and child was well, with normal sensation and no paralysis March 27.

Case 10.—Nettie B., 9 years. February 29, eruption of chickenpox, which followed a normal course. Two weeks later child was taken out by an elder sister and complained of being too tired to walk; was out a long time and returned complaining of pain in both legs and inability to stand or walk alone. When seen the next morning there was marked tenderness over the track of the nerves, diminished patella reflex. The inability to walk increased; pain became more marked with noticeable anesthesia; nearly entire obliteration of patella reflex. Symptoms remained about the same; child could walk with great difficulty when supported. The disposition was extremely "cranky," the reverse of her normal condition. The upper extremities were at no time involved. At the end of three weeks the symptoms diminished in intensity, and gradual improvement took place. The child was perfectly well by May 15.

Case 11.—Rose B., 11 years. Entered the New York Infirmary, February 20, with a mild attack of chorea; by March 22 there had been little improvement in the symptoms and 5 minims Fowler's solution was ordered to be given every three hours day and night, a minim to be added each day. On March 29 she was taking 11 minims, when she vomited and the drug was discontinued for twenty-four hours. April 7, she was taking 119 minims, when a red papilla eruption was noticed, and symptoms of gastric catarrh, and the note was made that the arsenic had very little effect upon the chorea, so it was discontinued. April 13, the child seemed not to see and hear well. On the 19th very little twitching; May 2, no twitching. During this time the child had been disinclined to walk; had not seemed as intelligent as usual. May 12 the gait was very irregular and uncertain; dragged both legs; there was marked tenderness on pressure over the nerves; on the 21st utterly unable to stand alone, much pain over nerves, marked anesthesia in lower limbs. The symptoms of neuritis reached their height at this time and began slowly to disappear. June 4, began to walk a little with assistance; July 9 walking normally; no tenderness over the nerves; anesthesia had disappeared; discharged July 14, with no trace of either neuritis or chorea.

Several cases similar to Rose B. are found in medical literature, but the dose at the time of the development of the neuritis was smaller. This child received in the last twenty-four hours of the medication Fowler's solution ♏iiss, or 1 3/5 gr. arsenious acid. One case is reported by Dr. Roberts, in which the child received 66 minims in twenty-four hours in three doses. In my case the symptoms of neuritis at first closely resembled those found at the end of chorea. The weakness and paralysis, with the anesthesia, appeared abruptly. The upper extremities were not affected, but the trunk muscle seemed weak; the child could sit alone only for a few moments.

Case 12.—Anna J., 4 years. December 2, eruption of measles in the normal manner. December 3 the child refused to speak; seemed apathetic. A day or two later would smile and laugh without reason. Seven days after the first appearance of apathy the child could neither sit nor stand alone, cried when placed on her feet; marked tenderness over the track of the nerves in the lower extremities, with anesthesia. Between the third and the seventh day the symptoms gradually progressed and reached their height on the seventh day, remaining the same until the eleventh day, when she began to notice a little, and made her desires known by crying and pointing to objects, and attempted to stand but cried when placed on her feet. On the sixteenth day made an attempt to speak, but seemed unable to articulate; tried to walk on the nineteenth day, and was able to articulate; could stand alone and walk, but incoordinately, on the twenty-second day; by the twenty-eighth day could speak distinctly, if not excited, put words into sentences, walked about but staggered some; pain over track of nerves and anesthesia nearly gone. Child walked normally at the end of six weeks; spoke as well as before illness at the end of three months.

In none of my cases were the sphincter muscles attacked. The family history in all cases was unimportant, except in the case of George N., whose parents are alcoholic, and Charlie S., whose mother died of tuberculosis during the child's attack of diphtheria. All the children except Nettie B., were tenement-house children. The sanitary surroundings of John K. were especially bad; the child lived in rooms into which daylight came in midsummer only from 10 A.M. to 3 P.M.

The differential diagnosis was made chiefly from Landry's paralysis, but in this the paralysis begins in the legs, spreading from one to the other, then to the upper extremities; in my cases the paralysis began in both legs at the same time. In the cases of diphtheria the nasal voice and regurgitation preceded the loss of power in the limbs; in none of my cases was there a question of poliomyelitis. The question of Freidrich's disease, I think, could be thought of only in the case of the child with measles, the only resemblance being the disturbance of speech. From myelitis the diagnosis was made from the symmetrically located pain, and no involvement of either bladder or rectum, and in each case the distinct history of a preceding infectious disease, except in the case of Annie P., in which the diagnosis of an infectious disease was uncertain, but with the first symptoms of inability to walk, was present the regurgitation of fluids and nasal voice, which are not found in myelitis. The treatment consisted of strychnin, either by the mouth or hypodermatically; stimulants when indicated.

THE RECOGNITION AND TREATMENT OF EARLY MYXEDEMA IN CHILDHOOD.

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That myxedema is not a disease *per se*, but a symptom, or collection of symptoms, dependent upon the absence, or upon a diseased condition of the thyroid gland, is now generally accepted to be a fact, the degree of severity of the symptoms depending upon the extent to which destruction of the secreting portion of the gland in question has taken place. That cretinism, myxedema and goiter (so-called) are but

variations of the one disease, is a view that is gaining adherents, as closer study into these conditions reveals the similarity in many of their symptoms, and the excellent results obtained in their treatment by the same therapeutic means. Sir William Gull[1] first defined myxedema as "a cretinoid state supervening in adult life in women," and drew attention to the similarity between myxedema and cretinism, expressing his opinion that both are allied. Ord[2] and others have also pointed out this similarity.

The accepted cause of the conditions is either absence of, or disease of, the thyroid gland. If the gland is congenitally absent, we get the condition known as true cretinism, either congenital or sporadic. When changes in the gland occur early, we have the cretinoid condition, or early myxedema; when these changes occur in persons who have attained full physical

Sadie K.

Sadie K.

growth, we have myxedema. So much of value has been written of recent years in relation to the first and third divisions mentioned above, that it would be presumption on my part to add to or criticise; but in relation to the second, or type of early myxedema, it may be pardonable to present a few cases for consideration.

It was the occurrence of goiter in cases presenting some of the symptoms of myxedema, but in which growth had not been arrested, which first drew the writer's attention. In the adult, myxedema is nearly always found accompanied by a reduction in the size of the thyroid gland. Criminis,[3] however, records a case in Thibet, in which the gland was enlarged. In the Clinical Society's report, in 59 cases of myxedema noted, 4 showed enlargement of the gland, and in 3 of 22 of the total number of cases, the gland had previously been enlarged. It is very probable that, in these cases of enlargement, without exophthalmus, we have to deal with a gland in the early or hypertrophic stage of a cirrhosis. Where this enlargement or hypertrophy is not general, we probably have to deal with a simple hypertrophy of the functionating portion of the gland consequent upon changes in another portion. Murray,[4] in his excellent article on myxedema, says, in dwelling upon the differences between the varieties of myxedema: "In this connection it must be borne in mind that the actual size of the thyroid gland is not necessarily an indication of the amount of functional activity of which it is capable. A considerably enlarged gland may, from the nature of the structural enlargement, be just as incapable of carrying on its function as an atrophied gland." At the same time, the presence of a goiter does not of necessity presuppose myxedema, since that portion of the gland which remains may suffice in secretory power to continue the patient's normal health. Witness the fact that in some cases where goiter has been present from childhood, growth and the mental status have apparently not been interfered with, and the patient is, to all appearances, in perfectly normal health, but where the entire gland takes part in the process, the patient's health must suffer.

Having a change in the structure of the gland, we naturally get a change in the character, or quantity of the gland secretion, or both, and it is to this change that the symptoms of these allied conditions are due. Where the goitrous enlargement disappears under the use of thyroid extract or other preparation of this gland, it is very probable that, through the entrance of the active principle of the preparation—believed to be an organic iodin compound, discovered by Baumann and by him named thyreoiodin—into the system, the deficit of this compound in the patient's economy is made up, an equilibrium is re-established, and the abnormal activity of the healthy portion of the gland ceasing, this decreases to the original size.

In view of these facts, I think we are justified in looking upon a spontaneous enlargement of the thyroid gland occurring in infancy or childhood, as being the precursor of more pronounced symptoms of myxedema, if allowed to go unheeded.

In this connection the following cases may prove of interest:

Case 1.—Sadie K., $8\frac{1}{2}$ years. Both parents American. No tuberculous or specific disease on either side; maternal grandfather has a well marked goiter which, he says, has been present as long as he can remember. (Patient first seen during the early part of January, 1897. Child presents a well-marked tumor over the anterior and antero-lateral aspects of the neck. Tumor first noticed two years ago, and has been growing slowly but steadily ever since. Tumor corresponds to the location of the thyroid gland, and measures, as nearly as can be determined, about $3\frac{1}{2}$ inches horizontally, and about 2 inches vertically. (See Figs. 1 and 2.) The left side of the tumor (right of cut) gives a distinct sensation of fluctuation, presumably due to a cyst. The outline of the cystic portion shows the left lobe and the isthmus to be involved. Over the right lobe the outline is less distinct, and the sensation that of a solid growth.

Sadie K.

No pulsation over the tumor; no dilatation of the superficial vessels; no pressure symptoms; no apparent thickening, or scaling, or abnormal dryness of the skin. Hair coarse and dry; no falling out of hair has been noticed. Patellar reflexes unimpaired; no giddiness or headaches. It has, however, been noticed that the child's memory is somewhat impaired, in that she is beginning to forget her childish rhymes and songs. She is also less inclined to play with other children than formerly.

She was at first put upon the saturated solution of potassium iodid, in drop doses, t. i. d. This was continued for three weeks, with the result that the tumor became distinctly more tense and hard, but no smaller. January 26 the iodid was stopped, and the patient put upon a reliable preparation of thyroid extract, in tablet form, in doses of three grains, once daily for three days; after this in the same dose, twice daily, and then, after the same length of time, this was increased to three times daily, at which dose it was continued. Within two weeks a marked diminution in the size of the tumor was perperceptible, preceded by softening over its entire surface. By the middle of the following April the tumor had entirely disappeared, and the child was to all appearances normal. (See Figs. 3 and 4.) For some months the extract was continued in single daily doses of three grains, after which its use was again interrupted. Within a month the gland began to enlarge again. The resumption of treatment was again followed by a prompt reduction in size. The same results occurred in each instance, upon interruption and resumption of treatment. At the present time, and for some months past, the patient has been receiving a single dose of $\frac{1}{2}$ gr. every second day, and the gland and the general condition have remained normal.

Case 2.—Sylvester C., 11 years. Hungarian. Came under treatment during the summer of 1897, for a cough which had persisted for some months, accompanied at times by slight muco-purulent expectoration. Physical examination revealed signs of a mild tracheo-bronchitis. The thyroid gland was appreciably enlarged, although, owing to indistinctness of its outline, the exact measurements could not be obtained. On palpation, the enlargement was apparently uniform over the entire gland, and nowhere of a cystic nature. Inquiry revealed that the mother of the boy has had a goiter since childhood, but apparently enjoys good health. No family history of syphilis or tuberculosis obtainable, except that a paternal uncle died of phthisis. The tumor had first been noticed four years ago, and had grown slowly. No symptoms of mental change had been noticed. The use of thyroid extract was begun—in addition to a mild expectorant—in accordance with the plan outlined in Case 1, with the result that, after one week's treatment, the tumor had decidedly diminished in size. After three weeks the gland had returned to its normal size, and remained so until the case passed from under observation, some weeks later. This removal from treatment was reported to be due to the fact that the mother said that she had had a goiter from childhood without suffering, consequently she could see no reason for its treatment in the boy. The cough had disappeared entirely.

Sadie K.

Case 3.—Mary McD., 14; Irish parentage. The child was brought for treatment August 2, 1897, because of habitual constipation, frequently accompanied by headache. Further questioning and examination, because of the typically myxedematous character of the skin of the face, elicited the following facts: History of the beginning of the condition is indefinite. The mouth and limbs twitch a good deal at times. Sleeps poorly; is dull and listless, sitting in an apathetic condition almost the entire time; does not care to play. Memory very poor. The child is of an affectionate disposition but rather timid. At times develops a destructive tendency, although this is not marked; this condition has, however, been more marked during the past year. At times complains of a pain in the cardiac region, and of shortness of breath. Speech is indistinct and

stuttering. Seems to grope for the words. Slight thyroid enlargement. The child began to menstruate when 9 years old, and this function continued quite regularly for two years. During the past three years, however, it has been entirely absent. Thickening and puffiness of the skin, especially of the trunk and face; teeth irregular and of Hutchinson type; slight anemia; hair dry and wiry. No especial loss of hair has been noticed, although the eyebrows and lashes are scant. Some drooping of lower eye-lids, and puffiness of the skin under the eyes. Slight internal strabismus, noticeable only at times. Heart-action rapid and somewhat feeble.

Since the change in the child's condition was first appreciated, it has been noticed that perspiration has lessened, until now it is practically absent, even in hot weather. At the beginning of the change she was in next to the highest class in the primary grade in one of our Public Schools. As the condition developed the child was gradually "put back" into lower classes until she was again in the lowest class. Her teachers then recommended her removal from school. The girl is the product of the third conception. The first terminated at the seventh, the second at the middle of the eighth month. In both instances the fetus was still-born. No *direct* history of specific disease in either parent is obtainable. Several other children in the family are apparently normal and healthy. Weight 68 lbs.

The diagnosis of myxedema accompanying congenital syphilis was made, and the treatment, as outlined in Case 1, begun.

September 15, a gradual improvement has been noticed since the beginning of treatment. Child acts brighter; wants to go out and play. First change noticed was that the child, of her own volition, seized a broom and swept the room. Now desires to help her mother with work, such as drying and washing dishes. Speaks far more plainly. Begins to spell and write again. September 22, at the end of the first week of treatment weighed 65½ lbs; now weighs 70 lbs. She again takes up her slate and has begun to play with her doll. Recalls some facts about her class and teacher. November 1, much brighter; wants to go to school; sleeps quietly at night now. Has begun to read in the "first reader." Has become sensitive to the taunts of her playmates. Not much lessening as yet in the thickening of the skin. Since the above the child has been kept steadily under observation and treatment. The mental condition has slowly but steadily improved. While still far from being a bright child, she is, compared with her former mental state, a different being. The general physical condition, too, is much improved, although there is still much thickening of the skin. The thyroid enlargement disappeared within the first month of treatment.

The only unpleasant effect of the extract noticed in any of the cases, was restlessness during sleep in Case 1, after the treatment had been in progress several weeks. Cessation in the use of the extract for a few days was quickly followed by the complete disappearance of the symptom.

I have chosen to class the above three cases together as variations in degree of the one condition, myxedema, for I believe that in those cases of goiter in which thyroid extract exerts a beneficial effect, by causing the disappearance of the enlargement, we have to deal with a condition of the gland, which may, if unchecked, go on to the development of a more pronounced form of this disease, as we see it in the adult, or of the cretinoid state, according to the age of the patient. Furthermore, I hold a trial of the thyroid extract, in cases of goiter without exophthalmos in children, to be fully justified. Bruns[3], of Tubingen, in speaking of the treatment of twelve cases of goiter gave as the result: Four children (ages 4 to 12), were cured completely. At the end of a fortnight there was a marked decrease observable in the size of the tumor, and in one month thereafter it had entirely disappeared. In one case of goiter, accompanied by a cyst in the thyroid, the goiter disappeared, but the cyst remained unaffected by the treatment. He gave one to two drams of the fresh thyroid gland inclosed in a wafer, or in a sandwich, once a week. His conclusion was that the treatment succeeds best in children. Herrick[6] states that thyroid extract is of value in simple hyperplastic struma, especially in the young.

I am indebted to Prof. A. Jacobi and to Dr. F. Huber, his chief of clinic, for the privilege of reporting Cases 2 and 3.

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NEURAL DYNAMICS.

Presented to the Section on Neurology and Medical Jurisprudence, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

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The learned author of our most recent work on the nervous system and its diseases has said: "Some knowledge of the dynamics of the nervous tissues is of fundamental importance to the student of nervous phenomena and nervous disease, who should know something of the stimuli to which nerve-cells and nerve fibers react; of the manner and degree of this reaction; of the phenomena by which it is attended and of the nature of molecular transmission." (Chas. K. Mills.)

Progress in clearing up the mysteries which attend especially the origin of functional disorders of the nervous system requires more complete and exact knowledge of neural dynamics. And as the organic changes are but the secondary stages of disorders which were necessarily functional in the beginning of the derangement, faulty dynamics must account for these also.

In the nervous system, exhibiting vital phenomena either of normal or abnormal nature, we have to deal with matter and motion: the same two elements which underlie all the phenomena of the physical universe. Right conceptions therefore of the nature and arrangement of the matter which constitutes nervous tissue and of the motions which act upon it and originate in it are indispensable to a correct interpretation of nerve action. Our knowledge is changing and enlarging daily concerning the structure and arrangement of the nervous tissues which constitute the machinery that serves to receive, transform and transmit the motion peculiar to it, and this added knowledge requires us to modify the conceptions we have previously entertained of the workings of that mechanism. It is but natural that the recent positive acquisitions to our knowledge of the minute structure of the nervous system have stimulated endeavors to explain by means of them many of the phenomena, both physiologic and pathologic, which are associated with nerve action, such as sleep, hypnotism, hysteria, epilepsy, etc., which have baffled all attempts at explanation and yet have for many reasons provoked perpetual inquiry. But it has seemed to me that all attempts at explanation that have come under my notice, even though they have called to their aid the evidences furnished by modern histologic research, have been too narrow in their conception and too limited in the range of elements considered as entering into the processes dealt with, to be of much profit in elucidating them. I refer especially to such suggestions made by several biologists and some neurologists as the one that the phenomena of mental action, hysteria, hypnotism, sleep, etc., may be accounted for by the mobility of the dendrites of the cortex neurons. Even if we should

ultimately discover it to be a fact that the neuron prolongations possess such mobility—for this at present is little more than an assumption—the questions still remain to be answered: What occasions such movements? And how do they serve to transmit impressions from neuron to neuron? We must have firmer ground to rest on than that furnished by a doubtful ameboid movement of neural protoplasm before we can form a very rational or comprehensive conception of the dynamics of the nervous system.

Starting with the essential elements by means of which nerve phenomena are manifested, we find them consisting of three main sets of neurons: 1, The afferent (or sensory); 2, the central; 3, the motor or efferent. These constitute the machinery for transforming various forms of what might be termed extra-neural energy into neural energy and again delivering it in some form to the outer world. In considering neural dynamics therefore, we have to occupy ourselves with the nature of this machinery, the neurons, and with the various forms of energy which it serves to transform.

We find the neurons discontinuous cell-elements best arranged for their effective work in chains, each link so related to its special associates as to, in some manner, influence them and not others. These cell-elements are composed of a vitalized protoplasm of highly complex chemic composition in which conditions are most favorable for a great range of molecular rearrangement and modification. The character of the arrangement and modification of the protoplasmic atoms and molecules will of course be determined by the nature of the motions to which they are subjected, and whereas, we can conceive a congregation of living protoplasmic molecules may offer at first some resistance to any extraneous form of motion by reason of their pre-existing inter-chemic and inter-molecular relations, yet any added motion from external sources to which they are able to respond would in time, by its frequent repetition, result in modifying their structure and arrangement. While we may not be able, as yet, either by chemic analysis or by microscopic research to distinguish any difference in the composition or structure of the protoplasm that makes up the substance of neurons differing in function, yet it is presumable that such a difference does exist, and is evidenced by their special capacity to respond to certain forms of motion and not to others. This assumption of the difference in molecular arrangement of the protoplasm of neural chains of different function, is still further justified by the very evident structural difference in the end-organs of the neurons where they first receive that form of motion to which they are especially sensitive and which constitutes their peculiar stimulus.

The human organism possesses six distinct forms of peripheral expansions of sensory neurons: olfactory, optic, auditory, gustatory, tactile, muscular, all of which can be readily demonstrated, and it is highly probably that sensations of temperature and the various forms of common sensation (such as that of position, pain, hunger, thirst, fatigue) have a special terminal nerve structure capable of responding to the conditions which attend each of them. It is chiefly by means of these special mechanisms constituting the end-organs of the sensory nerves that the human organism is capable of utilizing the various forms of energy which it receives and in turn transforms them into the neural and other activities characteristic of animal life. Energy in the form of translatory motion of comparatively slow and perhaps irregular periods is transformed into nerve motion by the tactile corpuscles and the nerve terminations in muscle spindles. More rapid translatory motion with shorter wave lengths excites the mechanism which ultimately reaches the special end-organ of the auditory nerve.

The sense of touch and the muscular sense are excited by direct pressure of an object on the end-organ, or by the communication of such pressure through the medium of the overlying skin or other tissues. In the sense of hearing the end-organ of the auditory nerve requires that the pressure be communicated through the medium of the elastic atmosphere, which, while it is motion of much greater frequency of pulsations of periods (16,000 per second being the ordinary limit of sound perceptions for the human ear), is still a form of motion that may be termed molar in distinction from molecular motion. The end-organ of those neurons that are designed to detect varying degrees of temperature are tuned to molecular motion in which the wave lengths and the frequency of vibrations far exceed those which excite the auditory sense. Radiant energy, which in its slowest molecular vibrations we recognize by the temperature sense as heat, consists of vibrations in the ether of at least 107,000,000,000,000 per second, and as the highest audible note that can be detected by the best trained human ear is produced by about 40,000 impulses per second, there remain over thirty-one octaves of vibrations which, in all probability, exist in the universe either in the air or in the ether, for which the human organism possesses no receptive mechanism by which consciousness can be impressed, since we have no sensory nerves adapted for responding to such vibrations as intervene between the highest sound vibrations that the human ear can detect and the slowest ones that are recognizable as heat.

The ether vibrations known to us have a frequency varying from 107,000,000,000,000 per second to 40,000,000,000,000,000 per second, a range which if expressed in musical terms would amount to about 8½ octaves. All of these ether waves are capable of transformation into heat or chemic action, according to the nature of the substance upon which they fall. The slower waves are, however, better adapted for transformation into heat, the more rapid ones for effecting chemic interchange. Certain of these ether waves, those with a rapidity of vibration from 293,000,000,000,000, to 757,000,000,000,000 per second "not only produce thermal and chemic effects, but have the power when they strike the retina of the eye of causing changes in the layer of rods and cones, which in their turn act as a stimulus to the optic nerve." The primary stimulus is here, as in the touch, muscular, auditory and temperature sense end-organs, a wave of motion communicated from an external source either by direct contact or through the medium of the air or the ether. If the rods and cones be wanting, as when the structure of the retina atrophies, ether waves, within the specified range for the normal retina, may beat upon the wasted surface continuously but without avail in exciting light sensations. The peculiar structural or molecular arrangement which is present in the normally acting rods and cones of the retina is indispensable for the production of visual sensations, as likewise are ether waves of the proper rapidity.

While we do not know positively the nature of the change which takes place in any one of the forms of

sensory end-organ so far considered, when acted upon by its appropriate kind of motion, analogies in physics and mechanics teach us that the end-organ is simply a machine devised for transforming that special form of motion into another form of motion that we term nerve-motion. The majority of the facts, which we have not now time to enumerate, appear to justify the conclusion that the first step in this transforming process is a chemic change, a rearrangement in the protoplasmic molecules of which the cells in the end-organs are made up.

In the two remaining special senses—smell and taste—where the substance affecting the end-organ first enters into solution and is thus brought into intimate molecular contact with the cells forming the end-organ of the sensory nerve, the chemic nature of the primary step in the stimulation seems to be without question. Since atoms of substances known to us make up the protoplasmic molecules of these end-organs, and since motion in forms with which we are also somewhat familiar, are the primary agents of stimulation or excitation of these molecules, we are justified in attempting an explanation of what occurs by the use of these terms already familiar to us before assuming the intervention of any new or less familiar ones. We know that these various forms of motion do cause molecular rearrangement, that is, chemic modifications, in the complex organization of living protoplasm. Unstable protoplasmic compounds in the end-organs are shaken into an arrangement of molecules more stable, and the molecular or chemic rearrangement results in the setting free of a certain amount of energy in some form, to become potential or be expended elsewhere. What occurs as a result of this is a modification of some sort, in the peripheral neuron with which the end-organ is connected; a modification that enables it, in turn, to change the conditions present in more central neurons with which its ramifications are associated. Whenever the energy set free in a peripheral sensory neuron gives rise to changes in an associated central neuron that energy has taken the form of some sort of motion.

In the light of our present conception of the histologic composition of the nervous system, that of associated but disconnected individual elements, what is the form of motion that will best account for this influence which we see exerted by one neuron upon another? In attempting to answer this question we must remember that "chemic action implies electric action, electric action implies conduction and induction, distribution and attraction, resulting in movements which may be massive, molecular or atomic, and these movements result in selective groupings." (A. E. Dolbear.) It is possible that the resulting movements due to chemic changes and their accompanying electric action, which takes place in a neuron as the result of stimulus, may have at times a range sufficient to be detected under the microscope, provided the conditions are favorable, and so give foundation to the belief in ameboid movements of nerve-cells, but this is merely incidental. It is certainly true, and can be demonstrated, that the molecular disturbance within the protoplasmic contents of a living cell does cause a change in the surface tension of the cell, and this is accompanied by a difference in electric potential which is also demonstrable. Not only at the moment of stimulation would the living neuron possess this condition of surface tension and electric potential of static form, but this would be its normal condition at all times, as a result of the nutritive activities in the protoplasmic contents. At the moment of appropriate stimulation the electric potential would be in some degree changed—either increased or diminished—and the relations which neurons bear to each other in associated chains is such that a variation in the electric potential in one would be attended by a corresponding change in the others. Some such view of neural dynamics appears to be held by Broadbent, who in a recent address on "Brain Origin" (*Brain*, 1895), after reviewing certain of the current theories, has said, "It has long seemed to me that a conception which better fits in with all the phenomena of nervous action is, that instead of this passive attitude of the periphery and centers one to the other, and of the centers, sensory and motor alike, toward each other, the relation in all cases is one of mutual tension and resistance. That is, that at all points specialized for the liberation of nerve motion, latent energy is generated and exists in a potential form, which in the absence of restraining condition is a counterbalancing energy developed in the centers or peripheral nerve expansion, with which any given point is connected by nerve fibers."

My conception, suggested by the structure and arrangement of neurons, and one which appears to be justified by the facts as far as we know them is, that associated neurons bear the relationship to each other of charged electric condensers. A disturbance of potential in one can not take place without causing a correlated change in the associated ones. This implies that the substance separating the associated neurons is of the nature of an insulator or non-conductor. That a substance differing in structure and function from that of the neurons does lie between them, and that this substance does not interfere with the action of one neuron upon its associated neurons are facts which we must recognize. "In physics, proper, whenever there is a lack of continuity in the medium where energy is being transferred, there is a corresponding change in the form of the energy." (Dolbear.) Whatever the nature of the energy that is developed in the neuron, it must undergo some modification in order to cross the interneural substance. If a state of static tension in the neuron is created by the nutritive activities that are continually maintained within it—and of this there can be no doubt—then accompanying this static tension there will be set up in the environment of each neuron an inductive influence which, in a state of rest, will be exactly balanced by the opposing inductive influence emanating from associated neurons. But where action takes place, as when the peripheral sensory neuron is disturbed in its molecular arrangement, and so in its static potential, by some impinging motion acting as a stimulant to it, then the inductive influence surrounding the disturbed neuron, and which envelops or extends into the field of its associated neurons, is correspondingly modified, and this modification in induction in turn acts as a stimulus to the central associated neurons. It appears to me that the change which the energy undergoes in effecting its passage from neuron to neuron is of the nature of magnetic induction resulting from a change of static tension. Chemic action, heat, pressure or mechanic movement, none of them seem so well adapted to effect the definite and prompt reaction that follows the disturbance due to a stimulus, as does energy in this form of static electric tension.

My attempt has been to propose a theory which will not only account for the generation of what has been

termed nerve force, but which will also account for its conduction in the neuron, and its transmission from neuron to neuron. To do this I have sought to reduce to their simplest conceptions the physical and physiologic conditions present in the structure of the essential elements of the nervous system, and to state what appears to me to be the most probable physical results of such conditions consistent with the phenomena we observe. In recapitulation: The nutritive processes of the neuron, presided over by the nucleus, maintain the protoplasmic contents in that state of readiness for action which constitutes the primary or fundamental stage of all nerve function. This creates in the neuron a condition of surface tension and of static electric potential, and is perhaps accompanied by some protoplasmic or ameboid movement.

Each neuron in this state or condition has a restraining or balancing influence while at rest, upon all other neurons within its field of influence by reason of the energy exerted by it in the form of what is known as electro-magnetic induction.

The end-organs of the sensory nerves serve as avenues of ingress for such forms of motion as are attuned to their mechanism, and this added motion serves to create a molecular rearrangement of the nature of a chemic change in the protoplasm of the neuron, and this is accompanied by a change in the static potential.

A change in the static potential is inseparable from a change in the electro-magnetic field surrounding the neuron, and this variation of the electro-magnetic field acts as a stimulus upon every neuron associated with the one whose end-organ has been excited.

Thus conduction and transference of nerve force are, according to this theory, to be regarded as of the nature of electro-static phenomena.

DISCUSSION.

Dr. COE of Oregon—As I came in a friend of mine in another Section wanted to know where the Section on Neurology was to hold its meetings. I told him in the Baptist church. He said, "I think if there is any Section that ought to meet in the Baptist church it is the Neurological Section, because if any one gets into deep water it is the neurologists;" and I think that this is entirely too deep for me to discuss at this time.

Dr. D. R. BROWER of Chicago—I am not equal to the discussion of this important question. Some of the statements in the paper are facts, and these we all admit. As to the theories therein, they are plausible and reasonable theories, und I thank Dr. Herdman for the wonderful suggestiveness of his paper.

Dr. SEARCY—I have been much interested in the paper on the dynamics of the nervous system. It is one of the opening fields of medicine, and psychologic medicine especially. The unit of life is the cell, and the unit of the nervous system is the nerve cell. We are learning probably more of the action of the nerve-cell in the neuron of the cortex than in any other part of the nervous system, because we find those cells more isolated and more easy of access in their structure, their function and their site. As worked out of late, possibly we can say the dynamics of the neuron consist of the received motions, and adjusting its emitted motion to those received—which is a vital phenomena. The way I have criticized nearly all philosophic theories along this line is that we attempt to describe animate phenomena by inanimate phenomena; for instance, describing the functions of the neuron by a reference to electricity. We would simplify our work if we would describe vital motion by simpler vital motion, describing, for instance, the extremely complex nervous system of man by studying the movements in the lower organisms, in ameboids and protozoa, showing the movements in their simpler forms. We can grade up the vital phenomena from that basis much better than we can by attempting to explain them by inanimatephenomena.

Dr. ADAM A. FORD of Denver—One suggestion came to me in listening to this very able paper, and that is with regard to the ultimate action of the molecule, or rather the atom in the molecule, affecting the neuron extremity. The paper indicated a variety of different actions due to vibratory action up to a number of trillions. Where can we differentiate chemic action from other action? Can we not trace it to the various forms of vorticular action in the action of these ultimate atoms? I believe it is one of the theories of scientists, now accepted, that this co-ordinated form of action in the atom is vorticular action, and owing to the different formation of this vortex, together with its affinities, we have certain manifestations of power, of force. Might not the author of this paper explain this theory, so as to include vorticular action?

Dr. MEYER—I should like to ask Dr. Herdman with regard to the conduction time. The conduction time has been used in a great many of the du Beromo phenomena in nerve elements. It seems, if I may trust my memory of physics, that the difficulty of meeting the objections rising from the conduction time become rather greater in the theory suggested, than even in the idea that was originally held by du Beramo.

Dr. PETERSON of New York—The author has given a great deal of thought to this subject, and the critic of his paper should at least give as much time as he has to it. The paper is purely speculative, but speculative papers, I think, always have a certain charm. The theory advanced, in my opinion, is as reasonable a theory as ever given in neurol dynamics. If I understood Dr. Herdman rightly, it was based upon the installation and independence of the neuron. That is by no means proved, and the most recent researches would tend to show that it is probably untrue. However, theories like these are the tentacles of the scientific octopus, reaching out in every direction for truths, and therefore, are extremely useful.

Dr. W. J. HERDMAN—While, as has been said, such papers as this are largely speculative, my attempt has been to give a solid foundation of fact for the building up of those speculative ideas. The question of vitality has been raised. It is, as we all know, a very much debated question among physiologists at the present time as to whether all manifestations of vitality are not physical and chemic; that molecular arrangements have simply reached a certain stage when these are the natural outcome of the molecular and anatomic arrangement; and I must say that, from the recent investigations I have made on that subject, covering the last five years, the evidence is largely on the side of the man who holds what is called the mechanic view. It is with relation to that view, and to making it bear on the side of neural dynamics, that this paper has been prepared. I have not yet subjected the theory to the tests of nerve condition, as has been asked by Dr. Meyer. I have not conceived how it could be, or how the static condition of an individual neuron could be subjected to the test which has been made of nerve conductivity in the physiologic laboratory method, but some device, perhaps, can be arranged for bringing that under observation as well. It has seemed to me that we must take into consideration what we know in physics and physiology, and bring this knowledge together, and see how the two will dovetail.

UREMIC FOCAL LESIONS.

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The literature on localized lesions of the central nervous system occurring as a result of uremic attacks is very scanty. A diligent perusal of many American text-books on general internal medicine, as well as the text-books on nervous diseases, fails to find mention of the subject at all.

It is true that compared with the multiform manifestations of uremia, especially compared with the frequency of convulsive attacks, the paralytic attacks occur very rarely; or, perhaps, it were better to say, are rarely recorded, and this is probably due to the peculiar character of the paralytic attacks and to the rapidity with which the manifestations disappear. The study becomes all the more interesting because of the light which the subject seems to throw upon the nature of other central disturbances of the nervous system. If the advance in our knowledge of medicine has been marked in the past quarter of a

century in any one particular direction, it is in that of the somatic origin of the various forms of insanity and of the ordinary diseases of the nervous system, in other words, that the intellect or the soul itself is never affected, but that its disordered manifestations are due to a diseased condition of the media through which it acts. The first successes, among which we may mention Mendel's classic demonstration of the pathologic conditions underlying dementia paralytica, were followed by countless endeavors in all parts of the world to establish the relation between diseased conditions of the brain and the disordered manifestations of cerebral activity. The results, as regards cerebral localization and mapping out of areas of the cortex, with their distinct functions, both sensorial and motor, have, as you know, been crowned with brilliant success. It, however, had a tendency to narrowing our conception of nervous diseases, by referring, or trying to refer, all disordered conditions of the nervous system, psychical, sensorial and motor, primarily to the brain or spinal cord. We know today that the anatomic investigation of the majority of insanities and of all the so-called functional diseases of the nervous system has met only with signal failure

It may be held that this failure is due to the inefficiency of our physical and chemic means of investigation, but the probabilities are that we will have to go back to the old clinical methods of investigation: to study the human body in life as well as the organs after death. To look upon sickness, no matter what its character, may be a manifestation of a disordered condition of the whole body rather than a disorder of the function of one particular organ. In the light of recent investigations, especially of the functional diseases, we know that the brain and spinal cord are often more sinned against than sinning, and that a remedy for the relief of the functional affections is more often to be sought in correcting a disordered condition of blood, stomach, intestines, thyroid gland and kidneys, rather than of the brain. Bouchard, in his well-known publications on autointoxication, started the pendulum to swing away from anatomic investigations of the brain in functional diseases to the study of diseased manifestations of the more distant organs of the body. More beautiful and more classic disturbances of the functions of the central nervous system can not be found than the investigation of the nervous arrangements found in uremic intoxications.

I have purposely waited a very long time before publishing these cases, because I wished to be sure of the diagnosis. We know only too well how our most interesting and rare cases are cleared up and relegated to the classes of common diseases by time, which as a rule, shows us that that which we looked upon as a rare or extraordinary occurrence or disease was only an ordinary symptom out of time and place.

Case 1.—Uremia in which the first symptom was aphasia, which continued half an hour, followed by a convulsion and hemiplegia of the right side, with complete recovery in twenty-four hours. Mrs. C. K——, aged 62, married, mother of five children. No miscarriages, no history of syphilis. Patient, who is very heavy, had never been sick before. At noon, Nov. 12, 1895, while at dinner, in the best of spirits, and with a good appetite, she suddenly quit eating in the midst of her meal, attempted to speak, then muttered some unintelligible syllables, grew very much excited on account of her inability to speak, arose from the table and walked about the room. On account of her unintelligible jargon the family thought that she was delirous and had suddenly become insane. She could not make herself understood, was unable to answer the excited questions put to her, and on my arrival, about half an hour later, was much excited, tried to speak, but could not form her words. She stated afterward that she knew perfectly well what she wanted to say, but could not express her ideas in words. Her face was flushed and congested, the pulse full, hard and rapid. No vertigo, no vomiting, no difficulty of breathing. I obtained a specimen of her urine, and after ordering a purgative by mouth and enema, put patient to bed. On returning after about an hour, after making an urinalysis, I found her unconscious and in a violent convulsion. The convulsive movement, however, was limited to the right side. Respiration stertorous, face deeply congested, the left side flabby and relaxed, the right in a state of clonic convulsions, the left arm and leg were perfectly flaccid and relaxed. After cessation of consciousness the right arm and leg were completely paralyzed. A hot bath was given; profuse perspiration ensued on use of pilocarpin, diuretics and saline purgative. In about an hour consciousness returned, but patient was unable to speak. The paralysis of arm, face and leg was complete on awakening. About 6 P.M. patient began to talk, but not perfectly, still enough to make herself understood. In the course of the next few hours slight movement returned, and in twenty-four hours speech, as well as use of arms and legs, was again perfect. In two or three days the patient was able to be about. Was placed on a strict diet and treated with alkalines, baths and cathartics. The quantity of albumin gradually diminished, but never disappeared entirely. After eighteen months patient is still well; no recurrence of uremia or paralysis. Albuminuria still present; quantity very slight. One interesting point about this case is the double focal lesion—the left third frontal convolution and the right psychomotor area.

Case 2.—June 15, 1896, Mr. H., aged 61, married. Parents both died at an advanced age, presumably from bronchopneumonia. Has not been sick from childhood. Has been a hard worker all his life, doing the work of a molder. While eating dinner, just at the commencement of the meal, patient suddenly lost consciousness, his head sank on his breast and he fell forward, slipping out of his chair on to the floor. He was immediately picked up, and regaining consciousness in a few moments, was supported to the next room and laid on a bed. The family noticed that his face was drawn to the left side, and that he made no use of the right arm or leg. There were no twitchings or convulsions of any kind. I arrived on the scene a half hour after the onset of the attack. Examination: Patient is still in a semi unconscious condition; can be aroused, however, and is able to assist at the examination. Pupils are normal in size and respond to light, both sides are equal, ext. muscles of both eyes are normal in their function. The right side of face has lost its expression, the naso-labial fold is absent on opening the mouth. The left angle is drawn upward. The tongue is protruded to the left. No loss of sensation in region supplied by fifth nerve. The right arm can scarcely be moved; there is not a complete loss of muscular power, but the grasp of the hand makes scarcely a perceptible impression. The movement of the right leg is good, but there is scarcely any motor power. Reflex of right leg very much diminished. No loss of sensation of either arm or leg. The examination of urine revealed the presence of albumin. Purgation and sweating. On my return, in three hours, I was surprised to see the muscular power of the leg normal; that of the arm greatly increased. On the following morning the paralysis had entirely disappeared.

Albumin remained in urine for about four months. Patient was treated by alkalines and a non-nitrogenous diet. For past eighteen months the urine has contained no albumin at all, and the patient considers himself entirely well.

Case 3.—This case shows one of those variations of focal lesions in which the paralytic onset occurred independent of an attack of uremic convulsions. It is true that the diagnosis is somewhat in doubt. The apoplectic attack may have been caused by an embolism or a hemorrhage from a small artery in the neighborhood of the internal capsule. In my opinion, however, the paralysis was, at first, so complete and the recovery from it so rapid and complete that I have no doubt but it belongs to the category of uremic hemiplegias. J. P., Grand Rapids, Mich., aged 55, unmarried. No history of nervous trouble in the family. Has never been sick, nor nervous. Dec. 5, 1897, at 9:30 P. M., patient, while playing cards, suddenly noticed that he could not use the right arm. A few moments later, while standing on the floor, he sank and would have fallen had he not clutched the table with left hand. The face became distorted at the same time, by the loss of use of right side. No diminution or loss of consciousness; no loss of speech. Patient was taken home at once in a cab. Physician

called and diagnosed right sided hemiplegia, with involvement of face. Urinalysis showed presence of large quantity of albumin. The attack was sudden, preceded only by violent frontal headaches of some weeks' duration. Regained use of arm in a few hours, and in twelve hours the recovery was complete. Use of leg regained in twenty-four hours. Six weeks after attack patient came to Cincinnati. The examination of nervous system was entirely negative. The examination of the urine showed the presence of 2 per cent. of albumin, large numbers of hyaline and granular casts. The case has been under treatment for Bright's disease for four months at the Good Samaritan Hospital. No uremic symptoms have shown themselves in this time. Quantity of albumin and number of casts remain the same.

Case 4.—The following case seems to bear out the theory that some local predisposition is necessary for the development of the paralytic attacks, some cause present in the center or area of the cortex which renders this center more liable to be attacked by the poisons circulating in the blood during an uremic attack rather than the other parts of the surface.

Mrs. F., aged 64, married, mother of seven children, all healthy, slightly nervous in temperament. Has never been sick before the development of Bright's disease some years ago. Was treated for arteriosclerosis and fatty degeneration of the heart for past three or four years. I saw patient first in January, 1896. Will not burden you with the text of examination except to tell you that she presented a typic fatty heart with well-marked arteriosclerosis. The urine on examination, dark in color, s.g. 1014, 2 per cent. of albumin, no sugar. In August, 1897, patient had a sudden attack of apoplexy, involving external recti of both eyes, especially of the right eye. The right side of face and tongue were involved. Complete loss of power in right arm and right leg, partial paresis of left leg.

Diagnosis: Acute bulbar paralysis, due to thrombosis of a branch of basilar artery in the upper part of pons. Patient gradually improved, and after three or four weeks was able to walk about, although with much difficulty. The arm recovered completely, the right side of face and tongue, as well as the right external rectus, have not recovered after a lapse of two years. On Feb. 12, 1898, was called to see patient. The attendant nurse stated that she had not been as well as usual for a few days; that she had had attacks of vertigo and felt sick at stomach; that she had been somnolent all morning and had not been able to move the right arm and leg at all.

Examination: Patient is in a stupor and can not be aroused sufficiently to assist in the examination. The pupils are contracted and equal in size. Unable to examine external muscles of eyes on account of coma. Constant twitching in the left side of face, loss of sensation of left side of face. The left arm and left leg are in a constant state of clonic spasm, the spasms are small in excursion and momentary in duration, following each other very rapidly. These spasmodic attacks have recurred three or four times in the course of two hours, an interval of fifteen minutes probably between each attack. During the interval the left arm and leg are seen to be completely paralyzed. The muscles are flaccid, relaxed, the limbs fall by their own weight without any resistance on part of the muscles; patellar reflex absent; sensation can not be examined into on account of presence of coma; right arm and leg normal.

Treatment: Purgatives; profuse perspiration induced by heat, applied by using hot water in rubber bags. Consciousness returned in about an hour. The diagnosis of left-sided hemiplegia confirmed by patient's inability to use the arm or leg. The paralysis of the arm and leg disappeared in four or five hours. On the next day the patient was in her usual condition. April 16, 1898, patient again had an attack of uremic coma, with left-sided hemaplegia, and again recovered as in previous attack.

A CLINICAL STUDY OF UREMIC PARALYSIS.

The four above-mentioned cases represent, with but slight exceptions, the clinical aspect of uremic paralysis, and we may draw up in a concise manner the clinical picture of this trouble.

The prodromal symptoms.—While the uremic focal disturbances seldom occur without premonition, we can hardly claim that it has any premonitory symptoms of its own. The onset of the attack is sudden, being either the ordinary uremic convulsion or a sudden attack of aphasia, Jacksonian epilepsy or paralysis, with or without convulsions or loss of consciousness. The premonitory symptoms are rather those of Bright's disease, uremic manifestations of a disordered function of other organs of the body, or there may be general cerebral disturbances, such as headache, vomiting and vertigo, or localized edemata, which are manifestations of a general uremic condition. The uremic attack as such may be typic in its character or it may not be.

During an attack of uremic convulsions with loss of consciousness, heavy stertorous respiration, a full, bounding pulse and contracted pupils, the convulsions may suddenly cease on one side and continue on the other, the limbs in which the convulsions have ceased become flaccid, the muscles become relaxed and when lifted up and allowed to fall, drop in the direction that the force of gravity dictates, muscles offering no resistance whatever to the falling of the limb. The tendon reflexes are usually absent; there is very often a complete loss of sensation in the affected limbs. The face often becomes distorted by the convulsions of the muscles opposite to the paralyzed side, the mouth becomes drawn over to the side free from paralysis, while the cheek on the paralytic side becomes distended by each expiration. Boinet lays down the rule that the uremic hemiplegia coincides always with the uremic coma, and that it disappears when the coma disappears. While this is the rule, we know from the study of reported cases that there are very frequent deviations from it. In the typic cases, it is suddenly noticed during the progress of uremic convulsions that one side of the body is stricken with paralysis in the manner above described. This hemiplegic attack continues during the entire uremic convulsion, and if the outcome is fatal the paralysis is present up to the time of death. If the uremic attack yields to treatment, the hemiplegia sometimes disappears as soon as a patient regains consciousness. In other cases the paralysis rapidly diminishes and in a few hours the muscular power is completely restored. Dr. Rose of Berlin states that these attacks can occur like ordinary apoplectic attacks; after a good night's rest the individual awakens in the morning to find himself paralyzed. Only in very rare instances does the hemiplegia last longer than twenty-four or forty-eight hours.

In rare instances, as Case 3 illustrates, the hemiplegia may begin and become complete while the patient is in full possession of his senses, and the attack is not followed by coma. Case 2 illustrates a mode of onset also rare, in that the coma and hemiplegia occurred simultaneously without being followed or preceded by uremic convulsions. The paralysis has all the characteristics of being cortical in origin. In the beginning, perhaps but for a few minutes, it is complete, but rapidly gives way to paresis. The chief characteristics of the hemiplegic attack are the flaccidity of the muscles and the rapidity with which the paralysis disappears. Boinet states that another of its characteristics is its variability. It is complete in the morning, diminishes at night and increases again in intensity a few hours later. Lancereaux reports a case in which the hemiplegia occurred first on one side of the body, disappeared, and then occurred on the other side. Case 1 is similar to this, aphasia occurring first in a right-handed woman, and during the uremic convulsion which follows there is developed a left-sided hemiplegia.

It is probable that cases where the paralysis was of long duration and those that were followed by contractures were due to localized hemorrhages in the cortex.

The paralysis of the facial muscles may or may not be present in these uremic hemiplegias, and when it is affected it follows the laws of cortical facial paralysis, namely, the lower half of the face alone is involved. Raymond reports a case attended with ptosis. Passing amaurosis is common. Bernard, Chauffard, Raymond, Chantemesse and Level report cases in which the hemiplegia was associated with conjugate deviation of the head and eyes. Aphasia occurring with right-sided hemiplegia is quite common, but occurring alone, or as in Case 1, occurring in a right-handed person with left-sided hemiplegia is very rare. In all four cases which I have recorded, at the time of the examination there was an absence of the loss of sensation. Boinet, however, states that there is habitual association and hemianesthesia with the hemiplegia, and that this hemianesthesia has all the characteristics of being cortical in origin. It is always incomplete and exceedingly transitory, often disappearing before the disappearance of the paralysis. Raymond reports one case in which the anesthesia affected the entire body, another in which the conjunctiva and the mucous membranes were anesthetic.

It is possible that at times also the anesthesia may affect the special senses, as Boinet's case, where the sense of hearing was lost for three weeks.

The prognosis as a rule is bad; the majority of the cases reported were fatal.

The hemiplegic attack itself does not offer a bad prognosis. The prognosis depends upon the severity of the uremic attack, and in my opinion the presence or absence of hemiplegia does not have any influence on the prognosis of the attack, the hemiplegia disappears simultaneously with it or it rarely lasts longer than twenty-four hours. The second of the cases reported in this paper is completely cured, the hemiplegia and the kidney trouble having completely disappeared. I do not believe, however, that there is any relation between the intensity of the renal disturbance and the cerebral symptoms, in this sense, that the most severe forms of uremic convulsions are apt to be followed by cerebral symptoms due to some inherent localized weakness in the cortex of the brain. It seems that the cases that are associated with high temperatures are apt to be fatal. Conjugate deviations of the head and eyes are also unfavorable symptoms.

The diagnosis is very easy, if the examination is carefully made. While it is true that ordinary apoplectic attacks caused by hemorrhage in the brain or by embolism in the cerebral arteries may be accompanied with epileptiform convulsions, an examination of the urine will clear up the diagnosis by demonstrating the presence of large quantities of albumin in the urine. We must not forget, however, that patients with Bright's disease, especially those with interstitial nephritis have as a rule arterial sclerosis and may have an attack of hemorrhage into the brain during the uremic convulsions, which may give rise to hemiplegia during the comatose state. The variability and the flaccidity of the paralysis, the normal temperature and the rapidity with which the paralysis disappears, will enable us to make the differential diagnosis. It will not be so easy, however, to differentiate the purely functional cases of hemiplegia from those due to minute hemorrhages into the cortex (Senator).

A very interesting feature of uremic focal manifestation is the occurrence of localized Jacksonian epileptic attacks. When we take into consideration, as we shall see later, the entire absence of any organic change in the cortex, this feature becomes all the more interesting, because of the almost universal association of an organic focal cortical lesion with the occurrence of circumscribed epileptic attack. Chantemesse and Tenneson, Chauffard and others have reported cases of this kind with autopsies, Dunin five clinical cases, Boinet one. In some of the reported cases the epileptic convulsions occurred during an uremic attack and in others preceded such an event or occurred entirely independent of a generalized intoxication. In Boinet's case four distinct and separate attacks occurred without the attack being followed by paresis. After the fifth attack, however, the hemiplegia set in. The above cited cases, and there are still more in literature, are pure cases of Jacksonian epilepsy. Case 3 in the present report presents a localized epileptiform seizure, but convulsions were present in the paretic extremities.

CAUSATION.

The real cause of these attacks is, as a matter of course, the uremic condition. As to the proximate cause, the authorities are divided. Most individuals afflicted with Bright's disease are subject to arteriosclerosis, and Senator holds that very often these focal disturbances are due to capillary hemorrhages. This opinion is shared by Wagner and Landois. That this may be true for some cases, especially those in which the paralysis does not disappear rapidly, can not be denied. But the autopsies which are on record seem to disprove this theory. Another theory advanced by Landois is that the paretic manifestations are the results of an exhausted condition of the cortical centers resulting from over-irritation resulting from the uremic excitation and subsequent convulsions. This theory, however, fails to explain the causation of those cases in which the Jacksonian epileptic attacks, the paresis or aphasia precede the uremic attacks or occur in uremia in the simple condition of coma.

There are but two possible explanations remaining: one is the toxic theory, and the other the theory of localized cortical edema of Traube. Traube's theory is the theory which ought to explain the occurrence of uremic convulsions in a mechanic way: as a result of edema of the brain there is produced a pressure upon the veins and capillaries which results in an anemia, consequently in a diminished supply of oxygen, and as a result we have the convulsions. Rosa (*Berlin Klin. Woch.*, Feb. 28, 1898) seems to think that it may possibly explain the focal symptoms of uremic attacks. Chantemesse and Tenneson seem to hold the same opinion, and Senator says that, "localized and circumscribed edema may explain the origin of uremic amaurosis and hemiplegia." The majority of authorities are agreed, however, that the uremic condition is the result of an autointoxication, and that the real cause of the manifestation is a chemic poison—urea, aceton or whatever it may be—which irritates the brain and produces the symptoms. But how does this bring us any closer to the answer as to how the focal symptoms are produced? We are once more thrown back on theory, for pathology reveals nothing to us. We know that certain parts of the cortex are more subject to the action of the chemic poisons than others, but if we wished to apply this to uremic conditions then the focal lesions ought to be

constant, occurring in every case of uremic convulsions. We can fall back on the old theory of individual idiosyncrasy, but it does not aid us much. Pierret and Senator hold that there may be circumscribed disturbances of circulation, a spasm of a vessel in a localized area of the cortex, resulting from some diseased condition of that vessel, such as arteriosclerosis. As a result of this spasm produced by the toxic condition of the blood, there is a localized ischemia with a subsequent paretic dilatation, stasis of blood, edema and intoxication of the cortex. Assenting to this theory, those areas of the cortex would be most likely to suffer which are supplied by vessels in a state of degeneration.

Baynaud and Pierret hold, and our Case 3 seems to bear out the statement, that focal manifestations due to old brain lesions, which, however, have disappeared, are apt to return as a result of all kinds of systemic infections and intoxications and especially in uremic conditions, which would seem to prove that areas of the brain weakened by some former insult and apparently recovered again, are more susceptible to intoxication than other areas which are normal.

PATHOLOGY.

The anatomic investigations of the fatal cases fail to throw much light upon the etiology of these attacks. They all agree in one respect, namely, that there are no gross anatomic lesions to be found in the brain or spinal cord. Prior to 1881 it was supposed that the hemiplegia occurring during uremic convulsions was always the result of a cerebral hemorrhage. Paetch, about this time, reported three cases in which the hemiplegia continued up to the time of death, and in which the autopsy was practically negative. In one case he reports the presence of an excessive amount of cerebro-spinal fluid and edema of the brain; in another the brain was perfectly normal. The former autopsy was made by Israel, the latter by Jurgens. Paetsch, who holds the theory of localized edema and serous infiltration, lays much stress upon the occurrence of the edema, but we see edema of the brain quite frequently without any paralytic symptoms during life. Dunin publishes another case which presented during life nystagmus diplopia and hemianopia, in which the anatomic examinations, both gross and histologic, were entirely negative. It is interesting here as a collateral proof of the intoxication theory of these focal lesions to refer to two published by Oppenheim (*Charité Annalen*, 1888).

The first case was one of hemiplegia with aphasia, the other a typic case of Jacksonian epilepsy, both being associated with carcinoma, one of the breast the other of the stomach. It was supposed during life that the occurrence of the manifestations on the part of the nervous system were due to the occurrence of metastatic growths in the brain. The autopsies were entirely negative; no changes were found in the brain. The author believes that the attacks were due to intoxication, and that poisons may affect circumscribed areas of the cortex of the brain.

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DISCUSSION.

Dr. SEXTON—I think the considerations which were brought forward in the latter part of Dr. Hoppe's paper lead us really toward the truth in regard to the theory of most of these cases which he is inclined to classify as of uremic origin when hemiplegia is present. It is not quite clear to me how we can have a condition which must necessarily depend upon a local lesion in the brain, without that local lesion ever being demonstrable, and I think that the history of these cases as mentioned is somewhat negative in that direction. What I mean to say is that we can scarcely see the mechanism of the poison which is supposed to produce the hemiplegia. My own opinion would be that the great majority of these cases really depend upon a local hemiplegia, a rupture of minute vessels, in which the absorption of the clot is so perfect that after death the autopsies do not give any evidence of its existence. I do not think there is any doubt that we have many cases of hemiplegia which are due to small hemorrhages. The fact that a quantity of uric acid is found in the urine I do not regard as conclusive, because, as Dr. Hoppe mentioned, the condition of the kidneys favor these ruptures, and it is more plausible to explain the existence of the hemiplegia upon that hypothesis than upon the hypothesis that a limited area of the brain should be poisoned by the uremia, while the remainder of the brain escapes. I have seen a number of cases in which there was a transient hemiplegia, and a certain portion of these cases have albumin in the urine, and yet I was never able to satisfy myself that the presence of Bright's disease was the cause of the hemiplegia.

Dr LODOR—It has been my good fortune or misfortune to see a great many cases of hemiplegia that I believe are uremic in their origin. I cannot believe with Dr. Sexton that there is an organic base for the origin of them. Uremic hemiplegia following childbirth is more common than most neurologists know. Following in the course of Bright's disease I have noticed those cases that have a rise of temperature—and a rise of temperature is almost entirely secondary—do not get well rapidly or get well at all. In cases that have no rise, or a small rise in temperature, the hemiplegia disappears quickly after the disappearance of the albumin. I cannot see how a hemorrhage could take place from a ruptured blood-vessel and disappear almost as if by magic, as these cases do.

Dr. TOMLINSON—I would like to add the evidence of my experience to confirm the conclusions of Dr. Hoppe's paper, and to call attention to three cases published by Dr. Burr of Philadelphia, in which the history was the same, and which appeared to be apparently true hemiplegia, and yet in which the autopsy showed nothing. In the last year I have had four cases which came to postmortem, and all these cases were cases of interstitial nephritis, with the same symptoms manifested as those described by Dr. Hoppe. One thing I noticed particularly was that the paralysis was not complete; that there were some groups of muscles that were not involved, and that it appeared and disappeared in different parts, coming and going from time to time. The face and the limbs would be paralyzed; the paralysis would disappear from the arm and become more grave in the face, and vice versa. I can also confirm the prognostic effect of the rise of temperature; it has been the same in my own experience. Another thing I have noticed in these cases postmortem, has been the intense edema of the floor of the fourth ventricle. I have concluded that the cause of death in these cases has been the result of this edema, from the uremic poisoning. In my own cases I was able to know of the existence of the nephritis for a long time before the paralysis appeared, and by careful examination to find all the indications of chronic nephritis. Since I have become familiar with them I have been able to almost anticipate these cases and to know what the result will be according to the extent of the nephritis. The recovery of the cases will depend entirely upon the stage of the nephritis. On postmortem, in spite of the most careful study, I have never been able to find any local lesion or disturbance to account for it. I have not made up my mind entirely as to vasomotor edema or vasomotor spasm. I am disposed to think there is a spasm which temporarily deprives that portion of the brain of blood.

Dr. ESKRIDGE—I rise mainly to call attention to the differential diagnosis of Jacksonian epilepsy due to organic lesion from these spasms, due to presumed functional disturbance of the cortex. When we have an organic spasm in the cortex, the muscles involved in the spasm are the last to be affected. The temperature is always high on the affected side, and the patient loses consciousness. I have not met a case of spasm, due to uremic poison, in which there has been much difficulty

in making the diagnosis between that and a limited cortical lesion. I have met with cases in which I was able to make an absolute diagnosis as to whether the paralysis was due to organic lesion or some functional disturbance. As we all know, a few hours' waiting clears the diagnosis in these cases. As a rule, in organic lesions of the cortex, only those muscles affected in the initial spasm will be paralyzed after the convulsion is over. In paralysis due to the effect of a poison, in nephritis and hemiplegia, paralysis of one arm and one leg is common.

Dr. C. EUGENE RIGGS of St. Paul—I think that Dr. Hoppe is to be congratulated on the exceedingly happy way in which he has put this very practical subject before the Section. I am inclined to believe, however, that there is a golden mean that Horace tells about, in which we can probably take a safer position than by saying dogmatically that these are simply due to toxemia, or simply due to hemorrhage. I confess to great sympathy with Dr. Sexton's view. We know that one-third of the cases of organic hemiplegia are probably due to Bright's disease; we know that Bright's disease produces hyaline degenerative changes, and slight pressure will cause this disaster. But we also know that the resulting phenomena depend entirely on the location of the hemorrhage. We all have seen these limited aneurysms in the brain, and if one of these aneurysms happens to break, the first effect is insult to the brain, in which you will find certain phenomena described by Dr. Hoppe, while in a very short time that will all pass away. I think that death may not only be due to the influence of uremia—you have all seen poisons so extremely toxic as to cause death in a short time—but it may also account for the temporary phenomena of paralysis. That seems to me a thoroughly clear and legitimate conclusion. As soon as the kidneys act thoroughly and properly the paralysis will clear up. While the uremic toxemia may account for a number of these cases, still there are a number of other cases due to hyaline fibroid degeneration of the brain.

Dr. C. C. HERSMAN of Pittsburg—I can scarcely conceive the idea that these paralyses are caused by hemorrhage. In one case that I saw, some time ago, the paralysis was so profound that I was almost persuaded to believe it was a genuine attack of apoplexy, but the clearing up was very rapid, only lasting a few hours. My surprise was, not that it cleared up so soon, but that it was so complete. It seems to me that if a lesion were present, we could scarcely expect such rapid recovery. It is possible, however, that a miliary aneurysm occurring, the profound shock to the part might be the cause of paralysis, and on recovery from the shock, the lesion not being extensive enough to cause a destruction of tissue would answer for the cause and the rapid disappearance. The theory as to vasomotor disturbance has been disputed by many; in fact, all the theories that I have seen suggested have been disputed by others. Consequently we can not say that we have any definite conclusion that we can hold to; but I am inclined to think that the cause is not a lesion or a hemorrhage, any more than it is in the case of epilepsy, or any other convulsion which we might have that is not caused by hemorrhage.

Dr. HEINS—I have noticed that the gentleman in speaking of these cases spoke of them as rather milder cases, and therefore allowed the possibility of recovery in that way. They speak of the percentage of albumin. A case of nephritis is not measured entirely by the amount of albumin that you have. If the gentleman says that 2 per cent. of albumin shows a small kidney lesion, then I would like to ask him what would be a larger percentage? I do not wish to be critical, but it strikes me it is a matter of some importance. It seems to me, too, that it is a bad thing for practitioners of medicine to cast away their anchors, and when you have, as Dr. Sexton has mentioned, an actual lesion that is the probable cause, to throw it aside. It is better to reason it out that way, than to say that there was no hemorrhage, because then you simply have no cause at all.

Dr. HOPPE—In answer to Dr. Hein's question about the percentage of albumin; as a rule the prognosis of kidney trouble is inversely to the amount of albumin present, the most fatal cases of interstitial nephritis being those that have the smallest percentage of albumin. Sometimes men will die without the urine showing any albumin. So the amount of albumin present does not have any bearing on the severity of the attack or the prognosis. The only difference about the paper seems to be as to the immediate cause of the condition in the cortex. We have actual facts at our disposal, and autopsies which have been performed by the best men in the world. I would call your attention particularly to the autopsies made by Jurgens and Israel in Berlin; not only did they make gross pathologic examinations, but they made histologic examinations, and not any trace was found of any change in the cortex. This is the history, postmortem, of all the cases in which the hemiplegia continued up to the time of death. When the Traube theory of localized edema was still in vogue, some of the autopsies showed edema of the brain. But we know that we find edema even in the brains of drunkards without having any symptoms of paralysis during life.

OCULAR HEADACHES.

Presented to the Section on Neurology and Medical Jurisprudence at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

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CHICAGO.

This subject is such a large one, and the views and experiences of ophthalmologists as to the rôle played by the eyes in the causation of this important symptom are so diverse, that it is difficult to give it the careful consideration that it merits in the short time allowed. When we reflect upon the mysterious character of headache and the unsatisfactory explanations advanced to account for it, we can understand the difficulty the ophthalmologist encounters when he attempts to give a reason for the faith that is in him, and to correctly interpret his clinical data. Even the exact seat of the pain is not known. Who can say whether it is in the brain itself or in the membranes covering it? In acute inflammation of these membranes it is quite probable that the severe headache is caused by the irritation of the meningeal nerves, but that is entirely different from the functional affair we are considering.

Just what influence vascular dilatation exerts in the production of this neurosis is equally uncertain. If it should be true, as claimed by some observers, that sensory nerve-fibers exist in the vessels of the brain, we could understand how distention of these vessels would give rise to pain, even without the increase of intracranial pressure. It is not improbable that the congestion of the mucous membrane lining some of the accessory cavities of the nose is accountable for many of the frontal headaches coming on after excessive use of the eyes, and this view is strengthened by the clinical observation that such cases are relieved only when, with the correction of the ocular defect, there is combined suitable treatment for the diseased nasal mucous membrane. That there are headaches induced by eye-strain is undeniable, and the discovery that the relief of the strain is followed by alleviation of the pain marks a brilliant advance in our therapeutics.

Notwithstanding that other general conditions may underlie the development of this neurosis, and the ocular condition may be only one factor, still its presence may for the time be a dominant one whose correction will strongly influence the future history of the case. And should the headaches recur at some time subsequent to the relief of the eye-strain, such recurrence would not disprove the value of the treatment, but would prove that some of the other underlying conditions had become dominant factors. Such complex cases are not infrequent, and show the importance of careful examination of the eyes in all cases of headache in which there is any doubt as to the etiology.

In most cases of so-called ocular headache, there is a history of the pain coming on after either mod-

erate or excessive use of the eyes for near work, but to this rule there are numerous exceptions. For example, some cases of excruciating vertical or occipital headaches coming on without any reference to the use of the eyes are relieved after wearing appropriate glasses. One cannot be certain therefore that no ocular defect exists because pain does not manifest itself in the eyes, or because headache does not come on with or immediately after the use of them. I shall not consider headaches occurring in connection with inflammatory conditions in or about the eye, for this would be foreign to the purpose of the paper, but shall speak only of those caused by 1, exposure to bright light; 2, strain of the ciliary muscle (so-called accommodative asthenopia); 3, strain of extrinsic muscles from incoordinate action (the so-called muscular imbalance).

EXPOSURE TO BRIGHT LIGHT.

Cases are not infrequent in which there seems to be a hypersensitiveness of the retina, which may or may not be associated with other nervous manifestations, and in such cases there may follow on exposure of the eyes to bright light a pain in the head or in the back of the eyes. With such persons a headache results when they look continuously at brightly illuminated and glistening surfaces, such as paintings in a picture gallery, a brightly illuminated page, especially if the paper is finely glazed, or if they are exposed to the glare of the snow or of a white, dusty road. The light from the electric lamps also seems to be peculiarly irritating to some eyes, and sufficient at times to excite a headache. In many such cases an examination will show some refractive error causing strain of the accommodation, which will aggravate the difficulty, but in others no such trouble can be found, or the symptoms persist after the correction of such a defect so that we are forced to conclude that excessive irritation of the retina will act as a cause of headache.

Of course, such hyperesthesia of the retina might be a precursor of inflammatory change, in which case a slight congestion of the vessels in and around the optic disc and the yellow spot would be noticed. But in many the ophthalmoscope reveals no such sign of inflammation, while occasionally there is seen only on careful focusing, a peculiar finely-dotted appearance of the retina in the region of the macula lutea, very much as if a mixture of pepper and salt had been sprinkled on it. Whether this represents a beginning pathologic change in the elements of the retina, or is the normal appearance of a retina that is unusually sensitive I do not know.

STRAIN OF THE ACCOMMODATION.

This is the most important and frequent cause of ocular headaches. When the normal emmetropic eye looks at an object more distant than 20 feet, the rays of light from that object are brought to a focus on the retina and produce a clear image without any effort on the part of the muscle of accommodation. If the object is nearer than 20 feet, rays of light emerging from it will not be focused on the retina of the emmetropic eye without the aid of accommodation, and the nearer the object is brought the more accommodation will be necessary. At 20 inches 2 D of accommodation are necessary, at 10 inches 4 D, at 8 inches 5 D, at 5 inches 8 D and so on.

This accommodation is accomplished, as we know, by a change of shape in the crystalline lens, brought about by the contraction of the ciliary muscle, and if this contraction is excessive there results a strain of this muscle, and even in certain cases a spasm of it, with resulting discomfort and sometimes headache. Children often contract a pernicious habit of sitting in a crouched position with the head bent forward close to the book, thereby putting a great strain on the ciliary muscle, and on account of the compression of the superficial veins of the neck, producing a congestion of the head which may lead to the development of myopia or even more serious complications. Often such children are precocious subjects — inordinate readers, as their parents will tell us — and of a nervous, restless temperament, and they are frequently brought to the specialist for eye-ache and headache. In some of them no error of refraction is discoverable, or the error is so small as to be quite insignificant, and they are benefited by correcting the method of reading and having them use the eyes less for near work.

The hypermetropic eye, by reason of its anteroposterior diameter being too short, is unable to focus parallel rays of light upon the retina, and accordingly accommodation is necessary to see even distant objects distinctly. This places an additional amount of work upon the ciliary muscle, and if astigmatism is also present, the strain is even more severe, for the muscle is constantly trying to correct the unequal meridians of curvature of the cornea, and is therefore contracting unequally. Such an eye is using its accommodation constantly, even for distant objects, and the work of the ciliary muscle is necessarily much greater when near objects are to be seen distinctly. In such a case the ciliary muscle undergoes to a limited extent a compensatory hypertrophy, and is able for a time to do the work assigned to it. But let its nutrition suffer because of impairment of the general forces of the economy, and that work becomes a burden that formerly was done with ease, and the unhappy subject is made aware of the presence of his eyes. Or if additional demands are made upon the accommodation, as for continuous reading, writing, or sewing, the muscle is found unequal to them, and pain is felt not only in the eyes but in the head. This is noticed also when the attention is closely fixed upon distant objects. Astigmatics frequently complain of headaches after going to the theater, or when traveling and looking at the passing landscape, or after a round of shopping.

In London they speak of an "Academy headache," the result of gazing intently at pictures during the exhibition. Such a headache may be partly due to the glare of the light from the brilliant colors on the canvas, and partly to the physical exhaustion incident to the loitering through a picture gallery.

Even slight degrees of astigmatism may be sufficient to cause considerable eye-strain under such conditions, particularly so if the astigmatism is of the oblique variety, in which the principal meridians of curvature of the cornea are no longer horizontal and vertical. The ciliary muscle seems to find greater difficulty in overcoming this kind of astigmatism.

When the individual is in perfect health he may be able to overcome a very considerable refractive error without experiencing any ocular distress, but if for any reason his vitality becomes impaired—particularly his nervous vitality—then he feels the additional strain, which may manifest itself in headaches. This is very noticeable in patients having hypermetropia

or astigmatism who are recovering from some severe exhausting disease, in young persons at the time of puberty, and in persons suffering from neurasthenia. A good illustration of this is to be found in a case of paresis or paralysis of the ciliary muscle following diphtheria. Even after the muscle partly recovers its power, it is very weak and easily becomes fatigued with slight accommodative effort, much more so if it has to overcome also a refractive error of hypermetropia or astigmatism, and this manifests itself by reflected pain in the head.

MUSCULAR INSUFFICIENCY.

We now come to the third cause of ocular headaches—the strain of the extrinsic muscles from lack of balance, so-called "muscular insufficiency" or 'muscular imbalance." This term assumes that one or a group of the eye muscles is too weak for its opponent, and there is therefore a tendency for the optic axes to deviate from the normal. This usually concerns the recti muscles, and of these the internus and the externus are the ones most frequently affected, although the superior or inferior rectus may show signs of weakness, and it is even claimed that at times the oblique muscles are at fault. If this deviation of the optic axes is apparent without tests, there exists strabismus, but if it is only latent, each eye fixing the object, and binocular single vision being present, it is spoken of as insufficiency of one or the other muscle. To this general condition the term "heterophoria" has been given by Stevens, and this is specifically divided into "esophoria, a tending of the visual axes inward; exophoria, a tending of the lines outward, and hyperphoria (right or left), a tending of the right or left visual line in a direction above its fellow."

Diplopia is so dreaded by the mind, and desire for single vision is so great, that extra effort is made to compel the so-called weak muscle to keep the optic axes in the right direction, and this effort is supposed to cause an unequal strain on the muscular apparatus of the eye that may excite all kinds of neuroses. Headache, megrim, chorea, neuralgia, insomnia, chronic gastric and digestive disturbances, epilepsy, nervous prostration and insanity are some of the conditions that are supposed to result from such eye-strain; and it has even been claimed of late by some of the enthusiasts in this work that an organic disease like trachoma owes its origin in many cases to insufficiency of some of the eye muscles. It is much more difficult to determine the effect produced upon the nervous system by strain of the extrinsic eye muscles, than it is to demonstrate such effect by strain of the ciliary muscles, even with extensive clinical data at hand. In the first place, the tests for heterophoria are not so accurate as those we use for estimating the refraction of the eye, and in the very nature of things they can not be. In the second place, we are dealing with a muscular apparatus far more complex than that which controls accommodation—a muscular apparatus which is innervated by three distinct motor nerves and is intimately connected with the sympathetic system; a muscular apparatus which is double, and must perform wonderful co-ordinate and conjugate movements.

It is extremely difficult to determine with positiveness whether the muscular insufficiency is due to weakness occasioned by organic defect of the muscles themselves, whether it is due to imperfect innervation of the muscles because of some trouble in the nucleus, or whether it concerns some of the higher centers presiding over co-ordination. In many cases it is even impossible to say whether a given muscle is too weak or its opponent is too strong. In the third place, we have not yet obtained accurate data as to the normal limits of mobility of the eye, and we are therefore not in a position to fix the abnormal.

The assumption that normal abduction must be sufficient to overcome a prism of 8 degrees and normal adduction equal to a prism of from 30 to 50 degrees is purely an assumption. While I am not prepared to deny that heterophoria or muscular insufficiency may in some cases be the cause, or one of the causes, of headaches and other neuroses, yet I hold that the results obtained by many ophthalmologists in the treatment of these cases, and adduced as proofs of the proposition are very far from conclusive. It is true there are cases in which operation on the muscles of the eyes seems to have accomplished results that are indisputable. I have had a few such cases myself, but the majority of them present such complex nervous symptoms, sometimes verging on the hysteric, that it is difficult to say whether, in treating the muscular anomaly, we are attacking the disease itself or only one of its effects.

In considering the location or variety of ocular headache it is impossible to specify any positive characteristic that will differentiate it from headache arising from other causes. In general we may say that the headache brought on by eye-strain is of a dull heavy character, although at times it may be sharp, excruciating and neuralgic, sometimes being so severe as to cause nausea or vomiting without its being a true megrim. Its most frequent seat is in the supra-orbital or frontal region over the frontal and ethmoidal sinuses, a brow-ache, or it may be described as a pain in the back of the eyes or deep in the orbits. The next most frequent location is in the temporal region, and the pain here may be throbbing in character. Occipital headaches are also observed, the pain being sometimes referred to the base of the skull or the nape of the neck, and even reflected to the back and shoulders. Ocular headaches affecting the vertex are, in my experience, less frequent than any of the others.

The most characteristic sign is the occurrence during or after excessive use of the eyes, as in reading or other near work, sight-seeing, shopping, etc., but, as I have mentioned before, this rule is by no means absolute. A person may awake in the night or rise in the morning with a headache apparently excited by an uncorrected astigmatism. As far as true megrim is concerned, my observation leads me to believe that eye-strain, whether accommodative or muscular, is much less frequently a cause of it than of any other variety. It is true that the attack may be aggravated by a refractive error, but I have seen so many severe cases in which no error or muscular anomaly existed, that I am constrained to believe that when such errors are present they do not act as a direct cause of the trouble.

TREATMENT.

As far as regards the treatment, it may be summed up very briefly. Every case of headache, the etiology of which is at all obscure, should receive a careful examination of the eyes, and this should include a most complete examination of the refractive condition as well as a thorough study of the action of

the muscles. Nothing short of an examination by the use of a mydriatic that will completely paralyze the accommodation is sufficient, as it is impossible to discover low degrees of hyperopia and astigmatism if the ciliary muscle is active. Lenses representing the full correction of the refractive error, less .25 or .5D, should be prescribed and their constant wear insisted on. They will not be tolerated unless the eyes are under the influence of a mydriatic, but with its help the eyes adapt themselves to the new relation. Some persons will be able to lay aside the glasses after the functions have returned to normal, without the recurrence of the headaches, or any of the symptoms that prompted their use. This is often noticed in certain cases at the age of pubescence, at which time the nervous equilibrium being so unstable, headaches may occur because of any excitement or irritation, and a slight hyperopia or astigmatism may furnish the cause. The correction of this defect by relieving the ciliary strain, may remove one of the factors and so prevent the headaches.

In cases where the trouble is not relieved by such measures, and it has been determined that a muscular anomaly exists, this should be treated by prisms, exercises, and means to strengthen the weak muscle before its apparently stronger fellow is operated upon.

In conclusion, I wish to emphasize a few of the points made in this paper:

1. There may be headaches which we may be justified in calling "ocular headaches," for in many of them there seems to exist a demonstrable causal relation between the eye-strain and the neurosis. Just how this operates it is impossible to explain at the present time. Possibly when the presence of sensory nerve-fibers in the walls of the blood-vessels of the brain has been demonstrated, such an explanation as the following may be plausible: "The irritation of the sympathetic nerves in the ciliary body by constant contraction of the muscle and the presence of the products of metabolism, causes through the vasomotors a contraction of the blood-vessels, followed by a dilatation and distention with resulting irritation of the sensory fibers."

2. While there may be a number of underlying conditions at work to cause a headache, eye-strain of any kind, if present, may be a dominant factor exciting the attack, or in aggravating it, and the relief of this strain will often exert a most favorable influence.

Finally, no study of headache is complete that does not reckon with the conditions that may exist in the eye, and when etiology is not perfectly clear these conditions should receive careful attention.

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DIAGNOSTIC CHARACTERISTICS OF HEADACHES ACCORDING TO THEIR ORIGIN.

Presented to the Section on Neurology and Medical Jurisprudence, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY H. GRADLE, M.D.

CHICAGO.

The object of the present paper is to point out those peculiarities of headaches which can serve as guides in the search for their origin. The author's experience pertains principally to headaches dependent upon affections of the special senses. But valuable lessons, too, have been learned—in a negative sense—from the study of those cases which, on investigation, proved to be of different character.

Before proceeding to details, I wish to explain the point of view from which I have been led to regard headaches of peripheral origin. While I agree with the general experience, that a large number of headaches start from some anomaly of the eyes or of the nose, I do not think that the detection of such a peripheral origin ends the investigation of the case. We must consider not merely the peripheral lesion, but also the condition of the nervous system. There are, indeed, certain peripheral conditions which will necessarily cause headache in every case; for instance, acute inflammation of the ciliary body, or acute suppuration of the nasal sinuses. But, on the other hand, inflammatory affections of a more chronic character and mere refractive anomalies lead to headaches only in some, but by no means in all patients. As I have elsewhere shown (*New York Medical Record*, Dec. 17, 1895), the difference in the symptoms hinges on the condition of the nervous system. Errors of refraction do not cause headaches in absolutely normal subjects, they simply produce local discomfort in the eyes. In those instances in which optic defects lead to headaches we can demonstrate a neurotic tendency by close examination of the patient, his family record, his personal history, or sometimes only his subsequent history. The more pronounced the instability of the nervous system, the more likely will comparatively trivial peripheral disturbances lead to headaches.

The characteristics of headaches are: 1, their location, and 2, their time-relations. Their severity is a less reliable guide for evident reasons.

Location.—The most important question concerning the site of a headache is whether it is wholly or predominantly one-sided. One-sided headache is always due to a lesion on the same side of the head, either intracranial or in one of the organs of sense. The only exception is that form of migrain which, though one-sided at the time, alternates regularly between right and left, for in this case the source is not one-sided, if it be peripheral at all. Conversely, however, one-sided lesions may in some instances cause headache not limited to the same side. This is sometimes true of unilateral errors of refraction, as well as of affections of one ethmoid or sphenoid cavity. Apart from the side of the head, the location of a headache furnishes no positive indication as to its source. Although headaches are, as a rule, located in the vicinity of the organ whence they are started, there are so many exceptions to this rule, especially in neurotic subjects, that it has but little diagnostic value.

Time-relations.—From the point of view of their time-relations, headaches can be classified as: 1, paroxysms recurring at *a*, irregular or *b*, regular intervals; 2, attacks following some specific act; 3, more or less continuous pain. In this connection, too, must be considered the date of suffering, and its manner of onset.

1. *a.* Paroxysms of headache of similar intensity and duration and occurring at variable intervals constitute the form called migrain. The experience of oculists is very definite regarding the ocular origin of many instances of migrain. How large the proportion is, the oculist, however, can not state, as his cases are relatively selected. If wholly or predominantly one-sided, migrain is surely dependent on

either an error of refraction, or, in a smaller proportion of cases, on some nasal disease. The only ocular anomaly to which I have personally been able to trace migrain, is astigmatism. Hypermetropia does not cause it. Regarding the so-called muscular anomalies, I have no definite experience. If there are eye symptoms, and especially if the migrain is on the side of the notably weaker eye, an ocular origin is very probable. Still, the absolute proof in a given case can only be furnished by the influence of glasses. Even when astigmatism is present, it is not always the cause of the migrain, and in some few instances optic correction proves disappointing. On the other hand, the absence of eye symptoms does not preclude the existence of a moderate degree of astigmatism as the starting-point of the headache. The form of migrain preceded by scintillations and dim sight—the *scotoma scintillans*—is not always of ocular origin, although often the result of astigmatism.

Migrain is in relatively rare instances induced by nasal disturbances. Gruenwald quotes some convincing instances of ethmoid and sphenoid suppuration. My own experience, however, has included but few cases of well-defined migrain depending on such disease. When Hack made his startling statements, about fifteen years ago, concerning nasal reflexes, he quoted a number of cases of migrain prevented by cauterization of the nasal cavernous tissue. These observations do not seem to have been confirmed to any extent. I have personally seen one-sided migrain occurring in connection with nasal stenosis of the same side. In three of these instances I was able to furnish a proof of the relationship, by the great improvement in the severity and frequency of the attacks after operative removal of the stenosis, but in none of the instances were the paroxysms entirely averted. Migrain of moderate severity and relative infrequency occurs in persons of apparently normal nervous sytem and good family history. But great frequency, great severity or massing of separate paroxysms into a continuous spell indicate other factors exerting a depressing effect upon the nervous system, besides a possible peripheral origin in the given case.

b. Paroxysms of headache with regular periodicity—recurring about the same hour daily—have mostly been the result of sinus disease in my experience. In most of these instances the pain should really be classified as a neuralgia. If, however, it is not strictly confined to a small area of nerve distribution, the patient may describe it as a headache. I have seen it in connection with acute or subacute inflammation of the various nasal accessory cavities. When starting from the frontal sinus it appears as a supraorbital neuralgia, which, however, may radiate into a diffuse one-sided headache. The diagnosis is not always easy, even on inspection, for suppuration of the frontal sinus of moderate intensity is sometimes almost latent, and often transient, though recurrent. But there was always the history of a preceding acute coryza. These attacks yield quite often to either quinin or antipyrin, even where there exists demonstrable sinus disease. In ethmoid and sphenoid disease the pain is more described as headache than as a circumscribed neuralgia—usually but not invariably one-sided.

2. Of headaches following specific acts the most characteristic is the pain brought on by the use of the eyes for near work. The more precise the coincidence of headache with eye-work, the more probable is the origin in either hypermetropia, hypmetropic astigmatism, or myopic astigmatism—in the order mentioned. I do not mean that this order represents the frequency of the three anomalies, but the probability of a headache occurring irregularly and not strictly proportionate to the amount of eye-work increases in the order mentioned. The more neurotic the subject, the greater the probability of headache occurring at irregular occasions during the day, but these eye headaches are never present on rising, and never severe enough to prevent sleep. In any deviations from this rule other factors must be sought for. In highly neurotic subjects these ocular anomalies may bring on headaches on using the eyes even for a distant fixation, as for instance, in the theater. Finally, there are rare instances, generally in anemic, sometimes in hysterical, patients of headaches following strictly upon the use of the eyes where no ocular anomaly of any kind exists.

3. Headaches more or less persistent, or with irregular intermission may result from the same optic anomalies, but only in run-down subjects. Very often other assisting factors can be demonstrated, such as stomach or intestinal disease, loss of sleep, and particularly insufficient out-door exercise. In other instances the refraction may be perfect, but other ocular disease be found. This is sometimes a peripheral choroiditis. Not rarely too, do we find the granular or salt and pepper appearance of the fundus, which I described last year (JOURNAL AM. MEDICAL ASS'N., Jan. 29, 1898), in connection with a highly neurotic disposition. It has seemed to me rather characteristic in such instances, that the pain begins at once on awaking. Continuous one-sided headache if at all connected with the eye, is usually indicative of some serious inflammatory condition, especially if of recent date and rapid onset. Optic neuritis—especially the retrobular form—is to be thought of, even if dim sight is not specifically stated by the patient. The most serious condition that may lead to such symptoms is glaucoma and the possibility of chronic glaucoma, as the cause of severe and persistent one-sided headache should not be lost sight of.

Among nasal diseases the forms most likely to lead to persistent and unusually severe headache, are the more intense suppurative inflammations of the sinuses, in which case nasal symptoms can always be elicited. Nocturnal aggravations are not uncommon under these circumstances. Moderate but very persistent headache is occasionally complained of in nasal stenosis of any kind, but only by distinctly neurotic subjects. It is less generally known that inflammatory conditions of the pharyngeal tonsil are sometimes the source of continuous headache, usually not very severe, in both children and adults; in fact, the existence of such transient inflammations in this region is not yet generally recognized. I have seen over a dozen instances where the postnasal mirror showed either the existence of scattered white spots of exudation comparable to lacunar tonsillitis, or suppuration with scabs on the abraded surface at the roof of the pharnyx. In most of these instances I was able to stop this headache by appropriate local treatment. I will add finally, that I have seen two instances of persistent, diffuse one-sided headache with irregular exacerbation which could not be traced to any peripheral source except carious teeth, and which ceased promptly after their extraction.

DISCUSSION.

Dr. FRANK P. NORBURY, Jacksonville, Ill.—I think the question of localized headaches is one that should be considered in a broader light than we have had it presented here to day; that is to say, aside from the question of the influence of the eye or of the nose. We frequently meet cases of persistent headache, localized headache, which on examination may not reveal errors of refraction or nasal disturbance, but which nevertheless are persistent and give rise to a great deal of concern, both on the part of the patient and on the part of the physician. We are consulted to relieve the patients from these distressing headaches. I think in all cases presenting persistent headaches it is our duty to go beyond the examination of the eye or the nose or the ordinary neurologic examination; that is to say, we should go into it from the standpoint of internal medicine, because it has been our experience that these conditions can only be relieved, in many cases, by a treatment of the patient as an individual. In one case in particular, a case of diabetes, there was a persistent headache associated with urinary symptoms. The diabetes had not been diagnosed. I subsequently made a diagnosis of diabetes, and the subsequent treatment, regulations, etc., relieved the patient of his headache.

Again, in cases of lithemia—so called uric acid cases—we meet a great many of them with localized headaches; the migrain not altogether limited to one side, varying from side to side, but they are essentially cases that can be relieved and oftentimes relieved speedily, and with permanence, if proper treatment be directed. The lithemic headaches are not unusual with school teachers or in the office men who are confined to their desks, and in persons occupying positions of responsibility wherein they have to use a great deal of mental power, and it is not unusual to find in many of these cases that the headaches are of lithemic origin and can be relieved, and relieved speedily. In Central Illinois, and in fact in the Mississippi Valley, we are apt to meet many cases of headache that are of malarial origin, this being determined by blood examination. Cases which have failed to yield to the ordinary treatment of correction of refraction, or of errors involving the nose, when placed on malarial treatment, are immediately relieved. Then, it is not infrequent to find in some forms of insanity a persistent localized headache. I allude especially to those forms of insanity that are due, say, to valvular disease of the heart. It is probably a rare form, but nevertheless there are cases of insanity due to changes either in the heart or in the arterial system, and I remember one case in particular where valvular disease of the heart was responsible for innutrition of the brain, which, when properly treated, relieved the patient not only of the headache but of the insanity as well. There are cases due to simple anemia, occurring during the adolescent period, and especially in girls. The headaches at that period sometimes, as you know, interfere greatly with young women in their work at college. In young women taking a course in the arts, where application must be constant, the headaches become so violent as to interfere with their studies. Of course, a headache is simply a symptom, and in our investigation of headaches we must be very careful to take into consideration the possibility of all diseases, applying in our diagnosis all the tests we possibly can before we arrive at our decision.

Dr. ROBINSON of Illinois—This is a subject in which I have great interest. I have looked at this subject of headaches, and watched the cases which have been brought before me for many years, including those that are sometimes called headache and sometimes migrain. The causes and treatment are beyond my caliber to understand. I know one family the members of which have had that form of headache for thirty years, occurring every two or three weeks, and the father, son and daughter, for four generations, have these attacks. I have in mind now one case where the patient has been suffering for more than thirty-five years with headache, which at first would come on by a pain over one eye, or a blindness. At the present time the attacks commence usually in the night, and in the morning the headache becomes more severe, and the patient is obliged to keep her bed from 24 to 72 hours. Nothing seems to relieve these paroxysms except morphia, and that only temporarily. The acetanilids, the stimulants, caffein, and all the medicines I have used, produce only temporary results. I have looked upon these headaches from the standpoint of uremic or uric acid poisoning, and I do not know but that may have some influence. But they recur regularly. In one case the patient will wake up about 2 A.M. with a severe headache. He either gets up and goes around town the next day, or takes a dose of acetanilid, caffein, bromid, or soda, which will frequently relieve the headache for two or three weeks. But the poison seems to be bottled up in the system, and breaks forth to such an extent that a strong man is a wreck, unable to do anything, and suffering more than I can describe.

Dr. ESKRIDGE—An interesting form of headache is suspended or postponed headache. I have not infrequently noticed that school children will go all week without suffering, and on Sunday invariably have a headache. The same is true of bookkeepers, who will invariably be attacked with headache on Sunday. This can be explained on the same theory that a person carrying a grip or other weight, getting accustomed to it, does not notice it until he puts the grip down. As to migrainous headache, I think we have to look for the cause first, to a defect in the constitution—a defect in the neural structure—and next to some defect probably in the nutrition; but the whole pathology is not known.

Dr. J. W. GIVENS, Black Foot, Idaho—The significance of headache to the patient is one of the things that we all have to confront in our daily practice. The label "headache" is very indefinite, but nevertheless it is the description of the condition of which the patient complains, and the one that we are called upon to relieve. I am sure what Dr. Gradle has said in regard to nasal trouble is true. We notice this fact in this mountainous country, where we have more or less catarrhal trouble. I feel that by attending to and relieving the nose we do a great deal toward relieving the headache. I also think that these wind-storms are responsible for a good many headaches. Then, too, as Dr. Eskridge has said, a great deal of headache is constitutional. The pathology of it in many cases is something like the pathology of epilepsy. We do not know what it is; but the headaches are, in their clinical picture, very like the picture of epilepsy. I do not know what can be done for those cases any more than I know what can be done for epilepsy. Most of them have to be endured. In all cases of headache I think we shall generally find a lowered condition of nutrition, and while the local conditions—the nose, the ear, the teeth—require attention, it is very important to keep the general health up to the very highest point of excellence by the use of pure food, outdoor life as far as possible, the use of cod-liver oil and the tonics, treating the patient, in fact, as we would treat a thorough-bred race horse, if we wanted him to win the race. Treat the patient in this way and keep him in that condition all the time, and you will minimize the likelihood of headaches, or at least reduce their severity.

Dr. WOODSON of Missouri—I have frequently found that headache occurs in anemic conditions, especially in chlorotic girls and in children that eat irregularly or that do not take time to eat, owing to their eagerness to get out to play. I have also found headache occur in persons who give away to fits of anger, or in persons who attempt to overwork themselves, doing as much in one day as they ought to do in two; in persons who sleep in apartments that are not supplied with a sufficiency of fresh air. I also have frequently found headaches associated with catamenal disturbances, and we find it associated with the lesions of specific troubles. So far as giving a fixed prescription for headache is concerned, it would be as impossible as a fixed prescription for any other trouble. As suggested by Dr. Norbury and concurred in by others, it is necessary to look out for the cause, and if possible remove it; in the anemic and chlorotic, insisting upon a sufficient amount of outdoor exercise, and well-ventilated sleeping apartments, with a bountiful supply of nutritious food, and so on throughout the other cases.

Dr. HAROLD N. MOYER, Chicago—I take it that Dr. Gradle's paper was not on migrain at all, that being only incidentally referred to. I suppose his title would have been more nearly correct if it had read, "Characteristics of *some* headaches according to their origin." But the particular kind of headaches to which his paper referred were those of ocular and nasal origin very largely, and how to differentiate those from one another, and also from neuralgia and the headaches of other origin, I take it, was the purpose of the paper. There is one valuable point in the whole discussion, and that is the conclusion at which Dr. Gradle arrives from his standpoint of the ophthalmologist, one who largely sees cases of eye and nasal trouble primarily. My experience is entirely from the other side, but I substantially agree with his conclusions. I believe that fully 70 per cent. of all the cases of headache that I see are primarily eye-strain headaches, and I would put myself in accord with Dr. Gradle's conclusion as to the indication by which we are to arrive at a diagnosis. Since the subject of migrain has come up, I might mention that I have recently seen a very interesting case suffering from an eye strain. This persistent eye-strain was relieved by the proper glasses, but the patient still has her migrain at stated intervals, showing that there were two kinds of headache present in the same

patient. As to migrain, there is no doubt that in all these cases we are dealing with toxemia, and I think that the investigations of Ratchford have shown conclusively that it is not uric acid, but some of the by-products, and I am satisfied that is the underlying condition in most cases of migrain. However earnestly you look for end-organ disease, however you eliminate eye-strain, there will be a very large proportion of headaches in which you will not discover the cause, and which you will fail to relieve.

Dr. HUGH T. PATRICK, Chicago—I should like to ask one question of Dr. Gradle. I understood him to say that one-sided migrain was due to eye or nose trouble in all cases. If he meant that statement, I wish to very positively and emphatically dissent from it. If he says that one-sided migrain *may* be due to eye or nose trouble, I agree with him.

Dr. C. C. HERSMAN, Pittsburg—Quite a number of times in cases of headache thought to be due to eye trouble the headache was not benefited by correcting the eye trouble. I think, as Dr. Meyer stated, we will find the trouble due to a toxemic condition. In some cases of angioneurotic edema we have excruciating headaches; it is almost impossible to relieve them without very heavy doses of narcotics, and while we have very little light on angioneurotic edema, still I think that is a toxemic condition. In this trouble sometimes the swellings come on close to the monthly period, or we may find it two or three times during the month. A great many of the headaches are attributed to improper food and irregular habits; but if you take these same patients and make them live the most correct life possible for them to live, the attacks will occasionally occur. I do not understand the reader as Dr. Patrick understood him. I understood him to say that when we did have a one-sided headache it was most likely to come on the side of the bad eye.

Dr. T. D. CROTHERS, Hartford, Conn.—There are two facts that I think are very prominent. I think all these cases of headache are practically poison and starvation cases. The whole philosophy turns on that, and if you can eliminate these two elements you are successful.

Dr. CHARLES H. HUGHES—The chair would like to remark that the phenomena of headache are too much viewed from one spot rather than from the whole individual. Any one who has had experience with migrain, of which I have had an abundance for twenty years, knows what constitutes migrain. In my own case I was in the habit of forcing mental action to the utmost limit by the use of coffee. For twenty years of my life I used a half-gallon of coffee between 9 o'clock and bed-time, and forced myself to a condition of wakefulness. I always slept in spite of coffee, but I learned afterward that I did not sleep in each twenty-four hours quite so much as was necessary for daily recuperation. My migrain came upon me in this way: first at the end of thirty days I was obliged to retire *hors de combat* for about one day; could not tolerate the light; so hyperesthetic that I could not tolerate sensation of any kind. The greater part of that day was spent in misery and retirement. Then the conservatism of nature asserted itself; the sleep which followed, and which was more than I was in the habit of getting, was a compensation, and I was restored to a more normal condition. When it became my misfortune to preside over the fortunes of a lunatic asylum these migrain attacks came on every week, and the only thing that conserved my vitality at all was the very fact that it knocked me out so completely that I could not do anything for nearly one day a week. The toxemic theory has found a very satisfactory lodgment in my mind. I have no headaches now, and have not had for fully ten years; but I have learned to take care of myself better. The amount of brain strain that a man puts upon himself is sufficient to bring about this condition of the accumulation of toxins, and they cause the trouble, as I think is no doubt the case in our epileptic conditions; but it is necessary to have an organism that is predisposed. Exophoria, esophoria, errors of accommodation and refraction of various kinds are associated conditions, and they tend, where you have a neuropathic condition that gives you the headache, to make the latent condition active; but I do not think, as the ophthalmologists assert, that they are every, the sole, exclusive and only cause. As Dr. Brower said, the removal of whatever source of irritation that may exist is good therapy; it is good practice in neurotherapy as in every other department of medicine; but to assume that these migrains are the result of just one thing is a mistake in my judgment. As to medical treatment of my headaches, I learned to use bromid of potassium, afterward bromid of sodium, and I learned to get more rest and to adjust the expenditure of nerve force to my capacity for daily accumulation. The same condition that will give you a diabetic urine will, in the cortex, in the meninges, give rise to a headache; but it seems to me that this whole subject is a subject concerning the treatment of the individual and his habits. Irritation in the eye will bring out a latent headache.

Dr. HAROLD N. MOYER, Chicago—Is it not true that nine-tenths or more of the migrains practically cease with advancing years?

Dr. HUGHES—That is a fact, I think. At 45 years of age the majority of people cease to have migrain. At that time of life when they begin to understand what life is.

Dr. MOYER—And when their blood-vessels get a little harder?

Dr. HUGHES—That may possibly be the explanation.

Dr. GRADLE—I was not presumptuous enough to come before a Section of Neurologists with a paper on the treatment of headache. My paper merely had to do with the characteristics of some headaches which were relieved by local treatment. I wished to present those symptoms by which the peripheral origin can be determined, and relief obtained. Dr. Patrick did not understand me correctly. I said in the paper that in every case of one-sided headache the cause was either a one-sided intracranial lesion, or an affection of an organ of special sense on the same side. I base this on my own experience. I have never seen an exception to this rule. I was always able to trace such a condition to some affection of one side of the head, with this exception, however, that those cases of migrain which alternate regularly between the right and the left side do not come in the category; they are not due to one-sided lesion, or any other lesion. I have been misunstood as to the importance of the peripheral lesion in causing headache, especially migrain. I stated in my paper explicitly that in every case of headache, not only the alleged peripheral causes but also the condition of the nervous system needed investigation. I added, furthermore, that there are some peripheral causes so potent that they would introduce headache in anybody, no matter whether they be in good health or not. For instance, a severe injury to the eye, causing inflammation, will invariably produce headache; or severe coryza extending into one of the sinuses of the nose will cause headache as a regular consequence, no matter how perfect the nervous system of the individual. On the other hand, an astigmatism of one diopter or thereabout will not necessarily give eye symptoms to a normal individual, whereas if the individual is run down, or other depressing factors are at work, he will have eye symptoms.

The question has been asked about the frequency of astigmatism as the cause of migrain. That the oculist can not answer, as his cases are selected. In the great majority of cases that were sent to me I was able to demonstrate an ocular origin, but, of course, only those cases came to me where a peripheral origin was suspected. I presume that a large number of cases of migrain have no peripheral origin. The proof is very definite that the peripheral irritation is sufficient to bring on these attacks. That other factors are present, also, there can be no reason to doubt, because of the periodicity of the attack. There must be some other factor. My paper did not deal with the pathology of headaches; I did not refer to these factors, and I am not at all sure that the toxemic theory is sufficiently proven.

In answer to Dr. Hughes' query as to cases of astigmatism coming on in school children while they are at work, and disappearing when they leave school for the term, I would say that the astigmatism does not really disappear; the astigmatism is stable in the majority of its conditions; the others are very rare cases. The strain is lessened when the child is at liberty. I consider it very one-sided and altogether wrong to finish the work by prescribing glasses, and not to consider the other factors at all. Of course, if the glasses relieve there is no reason why they should not be given.

EYE SYMPTOMS OF BRAIN TUMOR.

Presented to the Section on Neurology and Medical Jurisprudence at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10,1898.

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OPTIC NEURITIS.

Among the eye symptoms of brain tumor we naturally think first of optic neuritis, the most striking and significant symptom in cases of this class. Probably not a few practitioners have associated optic neuritis chiefly or wholly with intracranial disease or

intracranial growths. But while it is right that great importance should be attached to this symptom, occurring as it does in 80 or 90 per cent. of all cases, it is necessary to point out that its discovery is far from establishing a diagnosis of brain tumor. It is of very little value to indicate the location of the tumor, and it is worthless as regards revealing the nature of the growth. But it does show with great probability that brain symptoms accompanying it are due to serious organic disease. Even here, however, its indication is not absolute, for, in common with these symptoms, it may arise from different kinds of poisoning.

It has been a matter of some surprise in going over a series of my cases of marked optic neuritis, to find how exceptional has been its connection with intracranial growths, and how many cases occur in connection with other diseases. Thus, among 27 cases, but 17 were probably connected with serious organic diseases of the brain and its membranes, and only 8 of those were—probably five or certainly three—cases of brain tumor. The others arose in connection with renal and vascular diseases, syphilis, various toxic agents, chiefly lead and alcohol, disease in the orbit, or of the ethmoidal and sphenoidal sinuses, or were of such obscure etiology as to be classed as idiopathic.

Unfortunately, optic neuritis due to brain tumor presents no especial characteristics that separate it sharply from optic neuritis due to these other causes. Indeed, it is sometimes difficult to distinguish it from such an entirely different condition as the optic neuritis due to eye-strain, or from the protruding opaque optic disc that occurs in rare cases, probably as a congenital anomaly. So far is optic neuritis from fixing the underlying pathologic condition as one of brain tumor, that in determining the cause of the optic neuritis the other symptoms of the case have to be carefully considered. Still the ophthalmoscopic appearances do give certain indications of the cause of neuritis, which are of value in reaching a diagnosis.

Let us contrast the neuritis due to the various other conditions mentioned with the typic optic neuritis of brain tumor. Such typic neuritis is characterized by great swelling, sometimes 10 or 12 D (3 m.m.), abruptly limited, at no great distance from the margin of the disc, with arteries narrowed, veins dilated and very tortuous, and small vessels much enlarged, but not very numerous, because scattered through the swollen tissue; and small, flame-shaped hemorrhages upon or near the papilla. The other portions of the fundus, except for the alteration in the vessels, are normal, or present changes which are slight as compared with those at the disc, although to this last statement there are very important exceptions.

In contrast with the above: Swelling and discoloration of the disc, occurring as an anomaly, are never of very high degree. No such recorded case showed more than 4 D. swelling of the optic papilla, and in none that I have encountered was the most and prominent portion of the swelling more than 3 D. in front of the level of the neighboring fundus. Again, even with the higher degrees of such swelling the retinal vessels are normal; and the other parts of the fundus are normal, or exhibit no lesions like those of neuroretinitis.

Optic neuritis, due to eye-strain, is more common, but in this also the swelling is limited. The disc may be very red and yet the most prominent vessels be not over 1 D. in advance of the fundus. In this form, too, the larger vessels are but slightly altered, and the fine vessels of the optic disc are very much more numerous, but are not particularly irregular in caliber or very tortuous.

Under idiopathic optic neuritis, or optic neuritis of unknown causation, I should prefer to place the unusual but not very rare cases that have been ascribed to cold, rheumatism, disturbance of menstruation, etc. The ophthalmoscopic appearances resemble those of optic neuritis due to eye-strain, except that the swelling may be greater and the retinal circulation more interfered with. Optic neuritis of this kind is usually acute, and tends to early and comparatively complete recovery. The field of vision does not present great concentric or irregular contraction as compared with the ophthalmoscopic appearances, although the blind spot may be markedly enlarged and irregular. I have met with one case in which such optic neuritis, with great impairment of vision recurred, yet was followed by almost complete restoration to normal.

Optic neuritis in connection with gummatous growths is rather frequent in the tertiary stage; but it may also occur as one of the earlier secondary lesions of syphilis. I have seen it within three months after the initial lesion. In this stage it presents the clinical appearances of idiopathic optic neuritis and is rather promptly amenable to treatment. Of the form of retro-bulbar optic neuritis that leads to central scotoma without marked ophthalmoscopic changes it is unnecessary here to speak. But in rare cases, certain toxic agents, especially lead, may cause a form of optic neuritis that closely simulates that due to brain disease. It is usually chronic, and attended with great swelling and corresponding disturbance of circulation, while the general condition of the fundus remains, as in the optic neuritis of brain disease, comparatively good. I know of no signs by which one may, with the ophthalmoscope, discriminate between this form and the optic neuritis due to brain tumor. The diagnosis between must be based on other symptoms, that should be constantly borne in mind in connection with this subject.

But most frequently the doubt as to the significance of optic neuritis rests upon the resemblance of the lesions in certain cases of renal vascular disease, to those connected with brain tumor. The forms of optic neuritis due to these two causes may in typic cases be quite distinct, and in the majority of cases there is exhibited a certain divergence of type. But in some it is absolutely impossible to decide from the ophthalmoscopic examination to which class the particular case belongs; and in some, neuritis due to the one cause inclines rather to the clinical type of the other. The typic differences are these: Optic neuritis due to renal and vascular disease is more apt to be attended by hemorrhages and patches of exudation throughout the fundus; is more apt to be accompanied by the stellate grouping of white spots at the macula; is more apt to be associated with marked irregularities in the caliber and appearances of the vessels, apart from dilatation and tortuosity of the veins. Still, optic neuritis from brain tumor may be accompanied by general retinal hemorrhages and considerable areas of retinal exudation, especially at the macula, or between it and the disc (Harlan). Even the stellate group of white spots in the macula formerly regarded as pathognomonic of albuminuric retinis may be included among the retinal lesions connected with brain tumor (de Schweinitz).

With very extensive retinal lesions one may say that in all probability the trouble is of renal-vascular origin. With a complete absence of them, one may say that violent optic neuritis is probably due to organic disease within the cranium, but the possibility of confusion should not be lost sight of. Bearing it in mind, examination of the urine will usually show to which class the case belongs.

Given then a case of optic neuritis that can be excluded from the class we have just considered, its existence indicates with great probability the presence of grave organic disease within the cranium. Further than this we can scarcely go. It will be impossible to say from examination of the eyes that the cause is a brain tumor, a meningitis, or a cerebral abscess. The rapidity with which the neuritis runs its course will, however, in some cases give a valuable indication. Although Gowers shows that chronic neuritis never results from a rapidly growing tumor, in a tumor of very slow development the neuritis may be rather more chronic than from any other cause, slowly increasing for many months before vision is seriously impaired and running a course of years before it ends in atrophy.

OPTIC ATROPHY.

This is usually consecutive, coming on as the termination of optic neuritis. As such it has the same significance, and requires the same caution in excluding other possible causes.

Among 40, that I regarded as cases of consecutive atrophy, 13 were apparently due to organic intracranial disease; of these 3 were probably cases of tumor. The tendency in all cases is for optic neuritis to pass into atrophy, but in connection with brain tumor neuritis runs such a chronic course, that a large proportion of patients die before the atrophy predominates. The rapidity of the change to atrophy is usually related to the rapidity of the development of the neuritis. Marked permanent impairment of central vision and contraction of the field of vision are associated rather with the atrophy than with the neuritis. For a considerable time after atrophy is well-marked the evidences of previous neuritis remain unmistakable and not easy to overlook. But if the case be very chronic it is possible that the appearances which characterize the atrophy as consecutive, may be so trifling as to readily escape notice. These appearances are at first the remaining symptoms of neuritis; especially the swelling, now growing pale, the opacity which hides the disc outline, and the patches of exudate in the retina. Later the head of the optic nerve becomes clearly outlined, although still so opaque that the vessels can not be traced far into it. The vessels diminish in size, the veins as well as the arteries, though the former remain relatively large as compared with the latter; the vessel walls are more noticeable than normal, the vessel being sometimes accompanied by white streaks well out into the periphery. Patches of former retinal exudate may now appear as white degeneration, or only as areas of disturbed retinal pigment.

Around the disc may almost always be noticed some disturbance and absorption of the choroid, which is apt to be greatest at the upper and lower margins of the disc. This location distinguishes it from the somewhat similar choroidal changes due to previous eye-strain, which are generally most pronounced at the temporal margin of the disc. In rare cases simple atrophy, that is, atrophy without previous neuritis, has occurred in the course of brain tumor. It is due to pressure upon the optic nerves, chiasm, or tracts, or to direct destruction of the optic radiations or centers. Having this origin it becomes of considerable localizing value.

CHANGES IN THE PUPIL.

With impairment of accommodation changes in the pupil may occur as effects of direct involvement of the nerve tracts concerned. Sudden temporary disturbances may occur here, as they occasionally do in other forms of chronic organic disease of the brain and cord; but they have no especial significance with regard to brain tumors. The Wernicke symptom or reaction, or want of reaction, of the pupil to light thrown upon the blind half of the retina has in a few cases great localizing value. It throws no light upon the nature of the lesion which produces it. In attempting to elicit this symptom, especially when the vision is greatly impaired and the field contracted in all directions, it is sometimes necessary to throw the light into the eye from a point not greatly removed from the visual axis. In this way contraction of the pupil to light may be obtained, when, if the light were simply let fall toward the periphery of the retina, the result would be entirely negative. Of course, the nearer the light is brought to the direction of the visual axis, the greater the care that must be observed to insure that the pupillary reaction is not brought about by light falling upon the macula. Where the field of vision is still wide and the pupil reacts strongly to light, care should be taken that the light does not reach the seeing half of the retina through the sclera covering it, in sufficient quantity to provoke the contraction of the pupil, when, from light falling on the blind half of the retina, no contraction would occur.

To guard against this source of error I commonly use the light as reflected from the ophthalmoscope mirror, which can be concentrated in a small area upon the face and then turned so as to fall upon only the front and blind side of the eye. For instance, suppose a case of right homonymous hemianopsia—the left half of each retina blind—the source of light being behind the patient, the ophthalmoscope is held to the patient's right, as compared with his visual axis. The light is properly concentrated upon the brow or the nose, and then the mirror turned so that the light area will fall upon the pupil and portion of the sclera to the left of it, the sclera to the right of the cornea remaining in darkness.

PARESES OF THE EXTRAOCULAR MUSCLES.

In connection with brain tumor these are chiefly of value in the matter of localization, and the exact significance of each of the forms of extraocular paralysis in this direction need not now be rehearsed. In a general way such lesions, due to brain tumor, are more slow in their onset, and are longer in reaching complete development than those due to other causes, even perhaps those due to nuclear degeneration. But not much importance should be attached to this, since in connection with brain tumor their development may be entirely sudden.

A subject that has not attracted the attention it should have, and which will probably profitably repay careful study, is that of paresis or transitory disturbances of the extraocular muscles, which occur as distant symptoms with brain tumor, as they do with other

forms of organic disease, and which may be one way that the new growth causes such symptoms as headache and dizziness. In some cases at least they arise early, having probably much the same origin and significance as the mental disturbance, and the tendency to forced positions of the limbs, or involuntary movements that are sometimes seen. They are at least worth studying with the Maddox rod, the tendencies to deviation of the visual axes being taken when the eyes are turned toward various parts of the visual field.

NYSTAGMUS.

Although rarely accompanying blindness from cataract or corneal opacity, nystagmus is encountered in a large proportion of all cases of blindness from disease of the central nervous system. It is generally present when complete blindness has existed for many months in the course of brain tumor; but its occurrence in connection with other intracranial lesions robs it of especial diagnostic importance. It is probably more common and appears earlier in tumor of the cerebellum. In a few cases it appears while there is still fair sight, generally in connection with other disorders of the extraocular muscles.

IMPAIRMENT OF VISION.

Impairment of central vision and limitation of the field of vision may be of importance in calling attention to the existence of serious organic disease. The exactness with which they can be estimated quantitatively, gives them value as indicating the progress of the case. In the large majority of cases, however, they depend upon the optic nerve lesion and indicate its progress rather than that of the original disease. In a few cases where the affection of sight is due to direct involvement of the visual tract the changes in the field of vision become of the highest significance as a localizing symptom. Transient impairments may occur as a distant symptom, having the same significance as the mental disturbances and hysteroid symptoms.

Impairment of color perception can not be regarded as of a special localizing value. As Holden has shown, it may be merely a more delicate indication of the injury to the visual conducting apparatus, before this injury has become sufficient to interfere with the perception of form.

THE STIGMATA OF NERVOUS SYPHILIS.

Presented to the Section on Neurology and Medical Jurisprudence, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

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Specific lesions of the nervous system produce localizing symptoms similar in character to those which result from non-specific lesions having the same anatomic seat. Partial epilepsy of gummatous origin or hemiplegia from syphilitic thrombosis of the central arteries has no distinguishing features, per se; associate symptoms alone reveal its real nature. To describe these characteristic symptoms and to emphasize their importance in the diagnosis of cerebral syphilis in particular, is the object of my paper. A brief reference to the salient pathologic features of specific nervous disease is essential for the better understanding of the subject.

It is well known that syphilitic inflammation affects primarily the blood-vessels and meninges of the neuraxis. While no part of this extensive territory is exempt from specific invasion, the most vulnerable parts are the convexity of the hemispheres, especially in their anterior portion, and more frequently still the base of the brain from the chiasm to the annular protuberance, involving the apparent origin of the cranial nerves. In both the meninges and the blood-vessels these gummatous products occur in two different states of aggregation, the one focal, the other diffuse. In the pia-arachnoid they are generally circumscribed; in the dura, on the contrary, diffuse gummatous infiltration is the rule. In the arterial walls they are also found as plaques or patches resembling atheroma, or as extensive infiltrations of the tunica intima. Remarkable peculiarities of this tissue are its rapid growth, low vitality and the rapidity with which it undergoes retrogressive changes.

Since the meninges envelop every part of the encephalo-spinal axis, and the blood-vessels traverse all its conducting paths and functional centers, a great number and variety of symptoms are to be expected in a general infection like syphilis, with a special predilection for these tissues. The symptoms of specific involvement of the nerve centers are, therefore, apt to be not only multiple but multiform. The initial manifestation may be, indeed, single, but if the disease be left to pursue its own course, evidence of multiple lesions will soon appear. Thus a double hemiplegia with aphasia, depending as it must upon two foci of disease, points to a specific origin, while a right hemiplegia, with or without aphasia, being of necessity due to a single lesion, indicates a common source. Of like significance is the association of symptoms of involvement of the third cranial nerve on one side with hemiplegia of the opposite side. A very striking exception to the law of multiplicity of lesion is the isolated loss of the iritic reflex to light, which is considered by Gowers to be an important indication of cerebral syphilis.

We have already called attention to the fact that the morbid product of syphilitic inflammation, the so-called gummatous exudate, grows rapidly and as rapidly disappears. The symptoms depending upon such lesions must possess the same transitory character. And this is true of all disturbances resulting from the specific process itself. Paresis, aphasia, strabismus and hemianopsia (when not associated with hemiplegia) of acute onset and brief duration, point almost unerringly to the primary effects of gummatous exudations. We must recollect, however, that these products may damage the nerve structures by pressure or by interference with their blood-supply, and that these secondary lesions belong in the class of necroses or degenerations, of which the effects may not be transitory but permanent.

Syphilitic arteritis is a curable malady, but when arterial thrombosis occurs with consequent ischemia and necrosis of that vascular area, the pathologic process is no longer specific, and the clinical history merges into that of common lesions, the disability becomes more or less permanent. Gummatous exudates, compared with other new formations, develop rapidly, and this pathologic feature gives to many specific lesions a characteristic onset. Cerebral hemiplegia of common origin has, as a rule, a sudden onset. Gowers claims that a sudden onset is characteristic of all vascular paralysis. When, however, the hemiplegia depends upon syphilitic thrombosis the onset is rather subacute than sudden. It is preceded by headache in

three-fourths of the cases according to Fournier. Other prodromic symptoms, such as brief spells of partial unconsciousness, transient aphasia, motor weakness on the side afterward paralyzed, are often observed. Fournier observed six cases of hemiplegia from this cause in which the muscular weakness slowly increased from day to day, the hemiplegia being the terminal stage of the process.

Ischemia, from narrowing of the lumen of the diseased artery and necrosis following its complete occlusion, necessitates a subacute onset. Exceptionally, however, a sudden and even fatal apoplexy occurs in specific arterial disease, but such sudden fatalities are caused by rupture of an aneurysm of one of the large vessels at the base of the brain. Again, syphilitic granulation tissue undergoes rapid absorption, and if uninfluenced by treatment is soon reproduced. As a result of this pathologic character the symptoms depending upon the presence of such exudates have a characteristically irregular course. A disease which pursues a uniformly progressive course is, in all probability, not due to a specific process. In this respect we may compare the course of syphilitic dementia with that of progressive paresis. The symptomatology has many points in common, but the course of the two diseases is quite different. Dercum, in differentiating these mental affections, makes the following point relative to syphilitic dementia:

"Even when the mental symptoms have been established they may suddenly recede and marked improvement may take place, to be followed, after an irregular interval of time, by a renewed accession of symptoms. On the other hand, spontaneous arrest and disappearance of certain symptoms may occur, together with the sudden appearance of others entirely new." What is here stated in regard to dementia is equally true of many somatic lesions.

Recurrent vesical disturbance of temporary duration, especially weakness of the detrusor muscle, is exceedingly valuable in the diagnosis of specific disease of the spinal cord. The clinical history of irritation or pressure affecting the cranial nerves often manifests the same irregularity. Gowers calls attention to a relapsing palsy of the third nerve. The well-known variations in the extent of the visual fields and the alterations in the pupillary reaction to light under varying degrees of pressure in the second and third nerves, respectively, are instances of the same irregularity in the evolution of specific diseases of the nervous system.

Headache is another very important stigma of cerebral syphilis. As before stated, it is present in three-fourths of the cases. Dangerous complications seldom occur without this prodromic symptom. It may be truly said that syphilis, like the rattlesnake, seldom strikes without warning. This headache is intense, generally referred to the depth of the brain, an encephalalgia. It is seldom diffuse, but localized in a definite region. When seated in the parieto-frontal region it is either unilateral or predominates on one side. One of the special characteristics of this headache is the regular exacerbations followed by remissions or intermissions to which it is subject. Absent, or quite supportable in the daytime, it reappears or becomes intensified in the early part of the night, and subsides gradually toward morning. Exceptionally, its maximum intensity is in the morning at the waking hour. Very seldom, indeed, does it persist night and day without any variation. This headache is often accompanied by an evident change in the mental condition of the patient. In mild cases there may be only slowness of thought and inaptitude for sustained mental effort. In more pronounced cases there are veritable mental torpor, amnesia and a noticeable change of character. These prodromes acquire a still more precise signification when there are added to them formication and numbness of the extremities with transient or enduring pains.

Disturbances of sleep are also important stigmata of brain syphilis. Insomnia may be due to cerebral irritation, the result of initial organic changes in the blood-vessels or meninges. In other cases it is dependent upon the severity of the headache. The brain cells must be normally nourished to enjoy repose. The circulatory disturbances incident to specific changes in the brain tissue interfere with cellular nutrition, producing a state of irritable weakness and resulting wakefulness. Insomnia belongs, therefore, among the early manifestations of the disease. Like the other symptoms to which reference has been made, its diagnostic value is derived from association. Grey claims that both insomnia and headache cease on the supervention of paralytic or convulsive phenomena. In two cases of syphilitic hemiplegia recently observed by me, they were greatly, but not completely, relieved. Somnolency is a threatening prodrome of the cerebral complications of syphilis. It varies in intensity from mere drowsiness to profound lethargy. It is usually preceded by a period of very violent headaches. The sufferer pays but little attention to his surroundings. His countenance is dull and expressionless. He has attacks of vertigo, partial loss of consciousness and transient aphasia. He is usually compelled to keep his bed, sunk in almost continual sleep. At night there are mental wanderings and muttering delirium, resembling those of typhoid fever. His groans and complaints plainly show the continuance of violent pains in his head. If, during this semi-comatose condition, symptoms of involvement of the third pair of cranial nerves develop, such as diplopia, strabismus, ptosis, etc., they are evidently dependent upon basal syphilitic meningitis. Absence of fever and a tendency to spontaneous recovery, notwithstanding these ominous symptoms, are additional elements of great diagnostic value. In the milder cases the patient may attend to business, but his executive ability is greatly impaired. His memory is poor. He is unable to concentrate attention upon the matter in hand, and often falls asleep at work, though the previous night may have been passed in deep and continual sleep.

Circulatory disturbance, the result of arterial disease, is evidently the causal factor in these cases. Accordingly, many such cases, if not early detected and properly treated, eventuate in thrombosis, softening and hemiplegia. The value of these stigmata in the diagnosis of the cerebral complications of nervous syphilis is well illustrated in the case of syphilitic epilepsy. It is of quite frequent occurrence. Heubner encountered it twenty times in twenty-six cases of cortical syphilis. The attacks may assume all the known forms of comitial disease, from the mere vertigoes and momentary absences of petit mal to the convulsive attacks and psychic equivalents of grand mal. While the first attack may appear in apparently perfect health, it is usually preceded by the whole cortége of premonitory phenomena common to cerebral syphilis. Severe nocturnal headache is a very common precursor of

the initial paroxysm. The age at which it begins is likewise a valuable stigma. Essential epilepsy begins in early life. When, therefore, epilepsy makes its first appearance in middle life, it is in all possibility, of specific origin. Again, syphilitic epilepsy does not pursue the monotonous inexorable course of the common affection, but bears the stamp of irregularity. This irregularity is manifested by a gradual shortening of the intervals between the paroxysms, eventuating in a series of rapidly recurring attacks, coma and death. It never exists for any great length of time as an isolated affection. It bears the stamp of multiformity. There are soon associated with it various symptoms differing from those of the ordinary disease. Cortical paresis, at first transient and following the attacks, may become paralysis and persist indefinitely.

While there is some loss of memory in essential epilepsy, especially when it becomes chronic, in the specific disease memory is very greatly impaired, and in some cases complete amnesia is manifest from the very first attack. The symptoms of paresis or paralysis of the oculomotor nerves are often added to the combination. Double optic neuritis frequently coexists, this being in itself characteristic, in that its course is more rapid than when dependent upon any other lesion, not excluding cerebellar tumors. These stigmata also render valuable aid in the differentiation of syphilitic from paretic dementia.

1. Headache is present in both affections, but has different characteristics in each. In specific dementia it is of the usual persistent, paroxysmal, nocturnal type, while in paresis, though a very few severe spells are common, they never occur in long-continued series.

2. Syphilitic dementia pursues a characteristically irregular course. Paralytic phenomena which belong to the final stage of paresis may even precede the mental degeneration of the specific malady. The course of mental decay in paresis is progressive, with but few exceptions, while that of specific dementia is variable. In the latter some symptoms may wholly disappear to be replaced by others of a very different nature. Great mental improvement may take place, the mind may clear up and lucid intervals of long duration supervene.

3. If in a doubtful case, ptosis, strabismus, aphasia, or other paralytic symptoms develop, and especially if it be short-lived, the diagnosis is rendered certain, for suddenness and brevity are the brands of the motor phenomena of cerebral syphilis.

To recapitulate: Syphilis of the nervous system usually manifests itself in middle life, its serious complications being preceded by headache, insomnia or somnolence. It has an acute or subacute onset, pursues an irregular or atypic course, presents a multiplicity or multiformity of phenomena—the distribution of the paralytic symptoms being quite erratic—and causes a very early and marked impairment of the mental faculties.

Anatomic Studies in Insane Asylums.—Nissl made an urgent plea at the German Congress of Alienists, in September, for co-operation in the exact study of the anatomic foundations of the psychiatry of the brain. He proposed that a certain accepted region of the cortex should be studied by his method on a large number of brains in the various establishments, which will further the cause of science much more than a few single brains exhaustively studied.—*Klin-therap. Woch.*, September 25.

THYROID EXTRACT.

SOME RESULTS OF ITS ADMINISTRATION ON THE RED AND WHITE CORPUSCLES AND HEMOGLOBIN IN CASES OF ANEMIA ASSOCIATED WITH MELANCHOLIA.

Presented to the Section on Neurology and Medical Jurisprudence, at the Forty-ninth Annual Meeting of the American Medical Association held at Denver, Colo., June 7-10, 1898.

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The field of thyroid therapy, in the light of our present knowledge, is quite limited; experimental data have accumulated during the last year indicating various results. The most favorable, also the most reliable, were given by Ewald of Berlin, in epileptic psychoses, acromegaly, rachitis and Basedow's disease, to the International Congress of Medicine at Weisbaden; also by Professor Bruss of Tubigen, on goiter of the follicular variety, as being affected in a certain and prompt manner; cretinism is reported on by Schmidt; tetany and acromegaly by Schultz of Bonn.

Since beginning a series of experiments in cases of anemia, accompanied, or preceded, by melancholia, I have also observed some recent results, some of which were very good, obtained by Dr. Babcock of the St. Lawrence State Hospital, New York, in a variety of selected cases of mania and melancholia. At the Upper Peninsula (Mich.) Hospital for the Insane nine cases were under treatment in the first series, seven females and two males, all suffering from some form of metal depression.

Blood examinations were made before treatment, weekly, during and afterward, consisting of the enumeration of the red and white corpuscles and the estimation of the percentage of hemoglobin in each case. The counts were made with the Thoma-Leitz instruments, also by centrifugalization; the percentage of hemoglobin was estimated by Fleischl's hemometer. In normal blood in adult life the average number of red cells per cm. is estimated at about five millions for men and four millions five hundred thousand for women. The normal number of white cells per cm. is seven thousand five hundred. In hemoglobin examinations 100 per cent is considered normal when using Fleischl's instrument.

Case I.—A. K., female, age 27. Had been under treatment about three months, with very little, if any, noticeable improvement. Strong symptoms of passing into primary dementia were present. A selected diet, tonics, exercise and different forms of electricity were all utilized in her case, without any apparent improvement. She was pale and anemic, with a phlegmatic temperament, and was hallucinated. Liver and intestinal secretions inactive, complicated by constipation and mental inertia. Thyroid treatment was begun, giving one 5 gr. tablet three times a day; the dose was gradually increased until fifty grains were being taken daily. This treatment was continued for one month. The temperature and pulse were taken twice a day. During the first ten days of treatment the temperature fluctuated between 98 and 99.4 degrees. When the maximum treatment was given the temperature rose to 101 degrees, remaining there but one day, when it declined to normal, remaining there during the last week of treatment. Pulse at beginning numbered 62; on the second day 50; on the tenth 100; and during the remainder of the month ranged between 98 and 72, the latter when treatment stopped. Pulse increased in rapidity and volume as the temperature rose. When treatment was discontinued there did not appear to be either physical or mental improvement, and for this reason it was no longer continued; her weight now commenced to increase rather rapidly and in a month she gained seventeen and one-half pounds.

Blood examination.—Red cells were normal, or a little above, at beginning and remained so during treatment, until about one day before treatment was stopped, when they diminished about one million; they were about one-sixteenth normal size. Hemoglobin was below normal at beginning and increased about 10 per cent. during treatment; 90 per cent. at commencement, 81 third week and 77 at close. White cells were below normal at beginning, increased 3460 the first week, dropped during the fourth week, and at the close there was an average increase of 2760. In this case the red corpuscles diminished in both size and number, while the white, as also the hemoglobin, increased.

	Red corpuscles. Thoma-Leitz.	Centrifuge.	Leucocytes. Thoma-Leitz.	Hemoglobin.
Feb. 22 .	4,544,000		5,400	70 per cent.
Mar. 1. .	4,736,000		8,860	72 per cent.
Mar. 8. .	4,560,000	3,696,000	8,660	75 per cent.
Mar. 16..	4,776,000	4,032,000	5,040	81 per cent.
Mar. 22..	4,704,000	4,368,000	8,160	77 per cent.

Case 2.—M. E., female, age 23. Profoundly depressed, with an anemic appearance. Small amount of adipose tissue. Had been under treatment for nearly five months, without any beneficial results. No physical disease present. When thyroid treatment was commenced the temperature was subnormal, 97 degrees; pulse 80, with cold extremities. Mental activity very sluggish. Second day after this treatment had begun, temperature increased 1 degree; on the tenth day it was 99 degrees, and remained there during treatment. Three 5-gr. tablets were given per diem, and the dose gradually increased until 35 grains were being taken daily. The temperature reached its highest point when 25 grains were being taken. The pulse in this case did not vary much with the change in temperature; during the last week of treatment it ranged from 100 to 116, being a difference of from 20 to 36 at the commencement of treatment, while the temperature remained normal or below. This case was both stuporous and stubborn, was affected rapidiy, even by small doses. The cold extremities and surface generally was changed, the blood filling the superficial capillaries and continued so, with some improvement in mental activity, which lasted during treatment; no permanent improvement followed. This patient had received, prior to being admitted at the Upper Peninsula Hospital, a very severe burn, which necessitated amputation of arm at shoulder and subsequently quite extensive skin grafting. During the thyroid medication the old wound, which had almost healed, took on an irritative condition, retarding granulation quite seriously. Physical condition did not change, although she now shows a gain of five pounds in weight.

Blood examination.—The red corpuscles were small and above normal in number from the beginning of treatment until the close, about five million per cm. Leucocytes numbered 8330 at commencement and 5250 at close, showing a diminution of 3080. Sixty-seven per cent. of hemoglobin at beginning increased to 85 during the first week, second week 77, third 82 and fell to 64 at close of treatment, being lower than when treatment was begun. This case differs from the others in that the amount of hemoglobin was reduced, also the number of white corpuscles, while the red cells were not perceptibly influenced.

	Red corpuscles. Thoma-Leitz.	Centrifuge.	Leucocytes. Thoma-Leitz.	Hemoglobin.
Feb. 24 .	5,072,000		8,330	67 per cent.
Mar. 2 .	5,528,000		7,650	85 per cent.
Mar. 9 .	4,992,000	4,516,000	6,940	77 per cent.
Mar. 16 .	5,032,000	4,312,000	8,350	82 per cent.
Mar. 23 .	5,956,000	3,696,000	5,250	64 per cent.

Case 3.—H. G., male, age 30. Treatment begun with 15 grains and increased to 45 per diem. Before beginning treatment temperature was 97 degrees; on the third day 98; on the sixteenth 99.4, the highest point reached during treatment, dropping again to 98 and remaining there during the remainder of treatment. Pulse, 72 at beginning, increased to 100 and dropping again to 80 when treatment ceased. This case was of more than ordinary interest; a young man of good family became depressed and attempted suicide by cutting his throat with a meat-ax. After being received at the hospital, he was placed on appropriate treatment, such as tonics, exercise, gymnastics, games, etc., everything with a view to the removal of the cloud from his mental horizon. His case did not yield to this line of treatment: periodic depressed spells were becoming prolonged. At this time he was placed on thyroids. After two weeks' treatment, temperature began to increase, and *pari passu* the mental depression began to give place to a brighter, more cheerful and observing condition; so marked was the change in his general appearance that his friends, in visiting him, observed the improvement. No relapse has occurred and the periods of mental depression which were quite frequent before, have entirely disappeared. Patient was discharged, in every way much improved and, to all appearances, entirely recovered. His physical condition was a great deal better, having gained twenty pounds.

Blood examination.—Red cells were found to be normal, or slightly below, both in number and size; at commencement numbered 4,728,000, and about the same at the close. The leucocytes were below normal at commencement of treatment (5900) and at the close numbered 8,230, being an increase of 2330. Ninety-one per cent. of hemoglobin at beginning and 94 at the close. This case showed a marked increase in the white corpuscles and a 3 per cent. increase in the hemoglobin, while the character and number of the red cells were not materially changed.

	Red corpuscles. Thoma-Leitz.	Centrifuge.	Leucocytes. Thoma-Leitz.	Hemoglobin.
Feb. 26 .	4,728 000		5,900	91 per cent.
Mar. 3 .	5,096,000		6,280	90 per cent.
Mar. 10 .	4,680,000	4,704,000	8,500	85 per cent.
Mar. 17 .	4,784,000	4,256,000	8,230	94 per cent.

Case 4.—L. B., female, age 36. Under thyroid treatment one month, commenced with 15 grains and increased to 30 per diem. Temperature 98.5 when first dose was given; four days later was subnormal; on the tenth day rose to 99.4, the highest during treatment, and then ranged from 98 to 99 during balance. The pulse was slow at first, and remained so during the greater part of treatment, except during the last few days, when it ran up to 110 and 112. This patient's intellect was not very well developed: had given illegal birth to a child. Was anemic and did not respond to chalybeate and other adjuvants for the building up of the mental and physical condition. She suffered from melancholia agitata and did not improve, either physically or mentally, as the result of this treatment. It is now four months since the treatment ended, but the same fixed delusions and hypochondriacal condition remains. Her weight fluctuated and is now a little below what it was when treatment was discontinued. No blood examination was made in this case.

Case 5.—L. H., female, age 33. Mother of four children. Suffering from a mild form of melancholia with hallucinations. Had been under treatment in the institution about eight months before beginning with the thyroids, without any benefit. Commenced with the usual dose and increased to 25 grains daily. Temperature increased about 1 degree almost immediately, and at the end of thirteen days reached 101.2 degrees, declining gradually to normal and not rising again during remainder of treatment. Circulation increased gradually in conjunction with the temperature: when the latter was highest the pulse was 100, showing an addition of 40 beats, it being but 60 at commencement. At the close of treatment, there was no improvement, either mental or physical; indeed the depression seemed to be more profound and a more anxious appearance generally. Treatment was ended on December 22, and she was then placed on general tonics, together with electricity similar to that which had been given her prior to the thyroid treatment. Her weight now began to increase: during the first month gaining ten pounds; the second month eight pounds, and on the 23d of the third month, when she was discharged cured, her weight showed an increase of twenty-two and one-half pounds. A dense mental cloud which seemed to hang over her less than three months before, and seemed to be deepening, after this treatment gave way to a brighter, happier, more cheerful and appreciative responsive condition, which can only be appreciated thoroughly by her family, friends and those having her welfare at heart. No blood examination was made.

Case 6.—E. S., female, age 25. Mother of two children. Depressed. Had been considered mentally unbalanced for upward of four years before being received at the Upper Peninsular Hospital. Had made an attempt to destroy her two year old child by burning. Began taking 18 grains of thyroid daily, and increased to 27 grains in two weeks. Temperature was 97.4 at beginning; on the third day increased two degrees, and remained at 99.4 during the balance of treatment, with the exception of a brief interval, when it declined to about normal, but immediately rising again. Examination of the urine revealed, at first, traces of albumin, with very few pus corpuscles, urea normal, 2.8 per cent.; at the close of treatment, pus corpuscles had increased, specific gravity increased from 1012 to 1026. Pulse had increased from 66 to 116. Two weeks after treatment ceased her weight had increased six and a half pounds.

Blood examination.—The red blood cells were reduced, also the hemoglobin, the latter 14 per cent., and the white cells increased about one thousand.

	Red Corpuscles, Thoma-Leitz.	Red Corpuscles, Centrifuge.	Leucocytes. Thoma-Leitz.	Hemoglobin.
Mar. 12	5,072,000	4,704,000	7,540	94 per cent.
Mar. 19	4,884,000	4,704,000	7,690	90 per cent.
Mar. 28	5,040,000	4,368,000	7,640	80 per cent.
Apr. 2	5,176,000	3,696,000	6,950	82 per cent.
Apr. 8	4,364,400	4,368,000	7,030	83 per cent.
Apr. 15	4,704,000	4,256,000	8,850	80 per cent.

Case 7.—E. A. C., female, age 45. Suffering from melancholia, with delusions. Would sit in the hall without apparently observing any object or person, from day to day. Suffered from hemicrania. Began by taking 16 grains and increased to 35. Temperature was normal at beginning, and was not increased throughout treatment, but decreased, being 97 degrees at the end of thyroid medication. Circulation was much more affected than the bodily heat, increasing from 74 to 120 per minute during the first ten days of treatment. Urinal examination showed pus corpucles, epithelium and traces of albumin present throughout treatment; specific gravity 1018; urea 1.2 per cent. Weight remained practically the same during treatment, also after.

Blood examination.—In this case the red blood corpuscles were slightly decreased and the white increased, the latter about two thousand. Hemoglobin remained substantially the same.

	Red Corpuscles, Thoma-Leitz.	Red Corpuscles, Centrifuge.	Leucocytes. Thoma-Leitz.	Hemoglobin.
Mar. 26	4,448,000	4,368,000	5,160	80 per cent.
Apr. 3	4,061,600	4,256,000	6,400	82 per cent.
Apr. 8	5,088,000	4,480,000	6,950	82 per cent.
Apr. 15	4,401,600	3,696,000	7,000	80 per cent.

Mental influence.—In the last two cases there was a marked change: a despondent and forlorn appearance has given place to a brighter and more cheerful condition.

Case 8.—P. F., male, age 44. Suffering from stuporous melancholia. Began treatment with 15 grains per diem and increased to 30. Temperature was immediately affected, increasing from 98 to 101 on the third day after treatment had commenced. On the sixteenth day it rose to 102, declining to 101, and remaining there during balance of treatment. Pulse was not influenced so much as the bodily heat, not varying more than twenty beats. Notwithstanding the temperature was markedly influenced there was no improvement in the mental activity. Pus as well as blood corpuscles and traces of albumin and epithelium were present in his urine. In this case the bodily weight was not changed to any appreciable extent.

Blood examination.—The white cells, numerically, were not changed; the red cells were slightly diminished, while the hemoglobin was reduced 14 per cent.

	Red Corpuscles. Thoma-Leitz.	Red Corpuscles. Centrifuge.	Leucocytes. Thoma-Leitz.	Hemoglobin.
Mar. 28	4,548,000	4,592,000	6,850	79 per cent.
Apr. 4	4,184,000	4,144,000	7,570	76 per cent.
Apr. 11	3,700,000	4,592,000	6,660	75 per cent.
Apr. 18	4,208,000	4,480,000	6,500	65 per cent.

Case 9.—E. B., female, age 44. Mother of four children. Suffering from melancholia gravis or hypo-melancholia; great mental anxiety. Impairment of motion and inhibition, which dated back about one year from the death of her husband, who was killed by an accident in a mine. There was an entire suppression of the menstrual molimen. Every remedy, therapeutic and otherwise, was exhausted in her behalf, without permanent benefit. She began taking one 5-grain tablet three times a day on March 26, 1898; on the fourth day after beginning treatment the temperature dropped to 97 degrees. Twenty grains were given; the system seemed profoundly impressed; the temperature rose to normal, dropping again to subnormal, treatment was relinquished on the eleventh day on account of the increasing exhaustion. The pulse and respiration were increased slightly. The systolic cardiac impulse very much decreased. Lost eleven pounds in weight during the eleven days of treatment. No improvement in mental or physical condition either during treatment or since it has ceased.

Blood examination.—Red corpuscles increased 728,400; leucocytes 1,330, and hemoglobin 7 per cent.

	Red Corpuscles. Thoma-Leitz.	Red Corpuscles. Centrifuge.	Leucocytes. Thoma-Leitz.	Hemoglobin.
Mar. 25	3,624,000	4,144,000	5,200	70 per cent.
Apr. 2	4,362,400	4,368,000	6,530	77 per cent.

THERAPY AND THEORY OF ACTION.

There are, according to some very reliable authorities, two main theories advanced. The first is the auto-infection theory—the gland having for its function the destruction of the natural toxins; without the latter we have the condition known as myxedema The second is the internal secretion theory—the thyroid being considered as a secreting organ. The secretion is taken up by the lymph vessels and is necessary for the proper metabolism of the body, especially for nervous and connective tissue. According to either of these theories, the administration of the dessicated gland supplies the lacking secretion, which may be some chemic substance that is necessary to health or even life. Ewald, in a pithy sentence, states that the gland acts as an antitoxin against certain elements that appear as by-products of tissue change. The exact constituents of this substtance have never been definitely made known. An organic iodin compound from the sheep thyroid has been extracted, called thyro-iodin, and in the present state of our knowledge the weight of authority is in favor of this being the effective chemic agent in thyroid therapy.

The rationale of this treatment is not very clear. It may be of great value in mental diseases as a method of diagnosis, but it is difficult to comprehend just how this treatment could improve a case where degenerative changes have taken place in the cell structures. Based on the theory of auto-infection, frequently cases have occurred where malaria, typhus and pleurisy are capable of developing in the blood antitoxins that have resulted in curing cases of mental disease. It is not unreasonable to suppose that in cases of mental alienation due, it may be, to some toxin, rather than to a lesion of the brain, the action of the thyroid is to promote metabolism. This being the case, the utility of thyroid therapy is obvious. In the series of cases treated by me, I have observed that those who were not benefited are developing symptoms of organic disease and passing into a condition of chronic dementia, while in those who were improved, it is a reasonable deduction, on the antitoxin theory, that the condition was functional, and that cellular disorganization had not taken place. Nine cases received the thyroid medication and were under close medical supervision; in five cases there was a marked change for the better, the other four were not, so far as we could observe, favorably influenced, physically or mentally, either during the treatment or since. Three of the five who were improved began to increase in weight during the treatment, and two of them did not until after treatment was relinquished. The pscychologic effect was observed almost from the beginning of treatment in those who were permanently improved.

It was noticeable that the minimum dose would produce a systemic effect in some more rapidly than a maximum dose in others. Every case requires close observation and the dose graduated in accordance with the effect produced upon the nerve centers and circulation, or in other words, every case must be a law unto itself. Fifteen grains per diem was the maximum dose to begin with, in some gradually increased to fifty in accordance with indications.

The Modern Magazine.—Managing Editor—"How many pages have you?" Foreman—"Two hundred and twenty-four." Managing Editor—"Two hundred and twenty-four! That would be too bulky. How is it proportioned?" Foreman—"One hundred and ninety pages of advertising and thirty-four pages of reading matter." Managing Editor—"Bring me the proofs of the reading matter. We will have to cut down to 200 pages."—*Ohio State Journal.*

ACUTE MENINGITIS.

OBSERVATIONS ON DIFFERENTIAL DIAGNOSIS AND TREATMENT.

Presented to the Section on Neurology and Medical Jurisprudence, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

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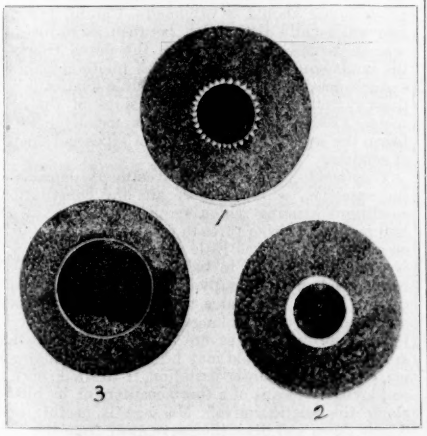
The differential diagnosis of the various forms of meningitis is, in my experience, often impossible. There are, however, two methods of certain diagnosis, when available. One is by lumbar puncture of the spinal cord, as recommended by Quincke and Ziemssen, and the bacteriologic examination of the withdrawn fluid to determine the micro-organisms which are present, and the other depends on the Skeer sign, described by me in a clinical lecture published in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, Jan. 7, 1888, and by Dr. Skeer of Chicago twenty years before. The Skeer sign when present will enable a diagnosis of



tubercular meningitis to be made very early. It is due to the deposition of tubercle around the pupillary margin of the iris. It shows itself first as a distant wreath of white clouds about a millimeter from the margin (see Fig. 1). This sign occurs before any change has taken place in the size of the pupillary orifice. After three or four days these minute cloud-like masses disappear and a yellowish-brown circle takes their place. (see Fig. 2), becoming more and more attenuated as the pupil dilates. These secondary changes are doubtless due to degeneration of blood-vessels from the tubercular deposits. Unfortunately, this sign is frequently absent, but when present is pathognomonic of tubercular meningitis.

The treatment of the various forms of acute meningitis is very unsatisfactory, as you all well know, not only because of the almost constantly present nausea and vomiting, but also because of the very high mortality. The difficulty of medicating by the mouth led me to adopt, some fifteen years ago, the method of inunction; first with mercury without any success, and then iodoform with some success. I prefer to use the 10 per cent. ointment of iodoform and lanolin, believing that lanolin favors the absorption of the iodoform, this to be applied daily to the shaven scalp. Absorption usually takes place promptly, as I have been enabled to detect the iodin in the urine and saliva one hour after the inunction. The amount absorbed can not be very great, as I have never seen the untoward effects that sometimes follow the use of iodoform in open wounds. I have used in the treatment of a single case as much as 10 grams of iodoform.

The following list of cases was seen in consultation with Chicago physicians from time to time and the results of treatment have been obtained from their statements:

	No. cases.	Recoveries.	Deaths
Dr. J. S. Hunt (deceased)	8	6	2
Dr. J. W. Fitzmaurice, 2876 Archer Ave.	6	4	2
Dr. P. H. Conley, 477 Grand Ave.	2	2	0
Dr. M. L. Loevenson, 523 S. Jefferson St.	2	1	1
Dr. W. D. Neel, 329 W. Erie St	10	6	4
Dr. David O'Shea, 109 W. 21st St.	7	6	1
Dr. Wm. Martin, 100 State St.	2	1	1
Dr. G. W. Reynolds, 1924 Arlington Pl	3	3	0
Dr. D. R. Brower, 34 Washington St.	5	3	2
Total.	45	32	13

In one of the cases that died in the practice of J. S. Hunt, and in one of the cases I have reported as terminating fatally, the Skeer sign was present, making the cases tubercular meningitis. In the other fatal case I have reported, lumbar puncture determined the bacillus tuberculosis to be present.

The following letter was received from Dr. George W. Reynolds:

> You asked me to write up the histories of the three cases of cerebral meningitis which you saw with me in consultation. Those cases date back a number of years, and no records of them are now in my possession, although the patients' histories, diagnoses and treatment are still vivid in my recollection. I can remember that after all methods of treatment had been tried and no improvement and death seemed inevitable, you suggested shaving the head and rubbing into the scalp a 10 per cent. inunction of iodoform daily. This treatment was continued daily until marked improvement was evident, after which the frequency of dosage was lengthened to two or more days until the patient was convalescent. In the first case, a child of 2 years, with all the characteristic symptoms of cerebral meningitis well pronounced, who had been ill two or three weeks before you saw him. At that time he was comatose, the fontanelle was open wide and the brain pulsations could be distinctly felt. High temperature and general symptoms indicating a serious cerebral meningitis, with a very grave prognosis. After a week or ten days of the iodoform treatment a marked improvement mainfested itself, and the same line of treatment was pursued, but less frequently, until the child appeared perfectly well and was discharged cured. I saw the patient a few days ago, now a boy 12 years of age, and was informed by his father and mother that he was bright and well up in his studies at school. The other two cases I have been unable to locate, although I have tried to do so, consequently my delay in sending you these notes. However, I can assure you that they recovered and were under my observation for one or two years after they were treated by the same method, and were, to all appearances, well. Yours very truly.
>
> G. W. REYNOLDS, M.D.

This communication is presented to the Neurological Section for the purpose of provoking a discussion on the two important topics indicated in the title, hoping to add something to our fund of knowledge in these important matters.

DISEASES OF NERVES REQUIRING SURGICAL TREATMENT.

Presented to the Section on Neurology and Medical Jurisprudence, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

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I appear before you, gentlemen, not as a neurologist but as a general surgeon. No specialty is entirely isolated. The work of any of us should interest us more or less. The best specialist is he who is well posted on subjects besides those in his own particular line of work.

The nervous system is the most wonderful system in the human body, connecting together, as it does, in some mysterious manner the mental and the physical. It has complete control of the physical, governing all our movements, both voluntary and involuntary. It depends largely upon the site of the lesion in the nervous system as to how grave will be the damage resulting. If in a terminal nerve, such as the ulnar, the parts supplied by it are rendered powerless and motionless; while an injury of the cervical region of the spinal cord reduces the body in an instant to a state of inaction, indifference and paralysis.

From what has already been said it will be seen that the treatment of disease and injury of the nervous system in so far as it interests the surgeon, affords an immense field for further study and research. This study is rendered further interesting from the fact that there is no system in the human body where recuperation takes place to such a marked extent. I am sure that it is a great pleasure to us all to note the very great advances that have been made in surgery of the nervous system within the past few years, so that cases are now successfully treated which but a few years ago would have been regarded as beyond human aid.

In considering the surgery of the nervous system we at once see that it is, of necessity, divided into three parts, namely: 1, surgery of the brain; 2, surgery of the spinal cord; 3, surgery of the nerves. In the third division we find two-subdivisions: *a*, injuries to nerves, such as contusions, strains, compressions, rupture or laceration, puncture, division, foreign bodies in nerves; *b*, diseases of nerves requiring surgical treatment.

This is the portion of the surgery of the nervous system that I wish to touch on. There are seven under this heading that attract our attention: they are sciatica, neuralgia, muscular tic, traumatic paralysis, traumatic neuritis, new growths and tetanus.

SCIATICA.

This affection is often called a neuralgia, but it is in reality generally a neuritis or a peri-neuritis. There are two forms: primary, which is generally of idiopathic origin and usually a neuritis; secondary, which follows some affection of the pelvis, spinal cord or hip-joint and is often a neuralgia. The more common causes are exposure to cold or damp, especially after severe muscular exertion, and the pressure of pelvic tumor on the nerves. Various constitutional conditions, such as gout, rheumatism, syphilis and anemia, are often present. About four males suffer from this disease to one female.

Morbid anatomy.—As stated above it is generally a neuritis; the nerve is red and swollen but the nerve fibers are not often destroyed.

Symptoms.—Pain of a shooting character, which passes down the nerve, is the principal one. The pain is due to the implication of the nervi nervorum. The pain is always increased by any movement. Some spots, usually at the notch and in the middle of the thigh, are more sensitive than others, and become exquisitely painful on pressure. The neuritis in rare instances ascends and involves the cord. Wasting of the muscles occurs in protracted cases, but the reaction of degeneration can seldom if ever be obtained. The duration as well as the severity varies very much, but as a rule it is an obstinate affection, lasting for months, or even, with slight remissions, for years. Relapses are common, and the disease may be relieved in one nerve only to appear in another.

Diagnosis.—Determine whether the disease is primary or secondary to some affection of the pelvis, spinal cord or hip-joint. Affections of the hip-joint can be easily distinguished by the absence of tenderness in the course of the nerve and the pain caused by movement of the hip-joint or by pressure in the region of the trochanter. If sciatica exists, and the hip-joint be sound, then the movements of the joint are free and unaccompanied by pain, unless flexion is carried far enough to render the nerve tense. A careful rectal examination should be made, and in women pelvic tumor should be excluded. Careful examination will usually distinguish between sacro-iliac disease and sciatica. Pressure on the nerve trunks of the cauda equina as a rule causes bilateral pain and disturbance of sensation, and as double sciatica is rare, these symptoms always suggest lesions of the nerve roots. Clearly defined differences usually exist between the severe, lightning pain of tabes and the pain of sciatica.

Treatment.—The internal treatment depends on the case, i.e., whether there are any constitutional conditions existing which require attention. Absolute rest in bed from three to five weeks, fixing the leg on a splint to have as little tension on the nerve as possible, has proved to be especially useful. Osler recommends hydrotherapy, especially the warm baths or mud baths. He states that many severe cases are much relieved by a prolonged residence at one of the thermal springs. In severe cases local applications are often useful. Cold may be applied by means of ice, coil, etc. Counter-irritation, if desired, may be employed by means of a thermocautery or by blisters along the sciatic nerve. Massage is useful; press deeply down and draw the nerve away from the cord. Where the pain is extremely severe, deep injections into the nerve of cocain or eucain, $\frac{1}{8}$ or $\frac{1}{4}$ grain, will give great relief. Morphin, on account of its being such a dangerous remedy in sciatica, because of the great risk there is of the morphin habit being contracted, should be withheld as long as possible, and only when the pain is really unbearable. Never allow a patient to use a hypodermic needle. If milder measures fail then operative procedures should be tried. These are either acupuncture or nerve-stretching. Acupuncture is performed as follows: The patient is laid on his face and any tender spots located by pressure. The nerve should now be punctured by several needles. This will cause a sudden, sharp pain to shoot down the thigh. These needles, which should not be more than a half dozen in number, after being left in for a few moments, are removed and a permanent cure results.

Nerve-stretching.—There seems to be some differ-

ence of opinion as regards the value of this operation in sciatica. Dr. Weir Mitchell states that he never yet met a case where nerve-stretching was necessary, while Erichsen says that this operation has been more successful in sciatica than any other painful affection for which it has been undertaken. This operation was originally introduced by Nussbaum as a mode of treating intense neuralgia following injury. But to Marshall belongs the honor of having first suggested its use for neuritis. He was first to conclude that nerve trunks must contain sensory fibers, distributed in their sheaths, i.e. the nervi nervorum. Since that Victor Horsely has clearly shown that medullated fibers terminating in tactile corpuscles exist in the perinsurium and epiceurium of all nerves. From this fact, then, we may conclude that the pain and tenderness of the nerves in neuritis is explained by the pressure upon the nervi nervorum and new connective tissue. Now, since in stretching a nerve the strain is first brought to bear on the sheath in which the nervi nervorum ramify it is easy to understand that they may be stretched or torn to such an extent as to destroy their conducting power, and thus render the nerve insensible without preventing its transmitting sensory and motor impulses through its proper tubules. It is more convenient to make the incision about the middle of the back of the thigh than at the lower border of the gluteus maximus, because here the whole of the ham-string muscles must be drawn inward and the nerve sought for external to them. Expose the nerve by an incision parallel to its course, properly clean it from the surrounding tissues, and then raise it with a blunt hook on the forefinger. Stretch it both centrifugally and centripetally; maintain the traction for about five minutes. The force to be used varies with the size of the nerve. The surgeon must decide as to the force to be used in each separate case. Experiments go to show that the breaking strain of a healthy sciatic nerve is never under eighty pounds.

NEURALGIAS.

These are nerve pains which may or may not be due to organic lesion; to functional disturbance of the central or peripheral extremities of the nerve or to neuritis in the course of the nerve. Neuralgia may occur in almost any part of the body, but is most frequently found in the division of the fifth pair of nerves. In some cases the whole or part of an organ may be affected, while in others one of the larger joints is the seat of very severe suffering. In a third class of cases the extreme cutaneous sensibility is the most marked symptom, the patient wincing and suffering severely whenever touched, however lightly.

Etiology.—The causes of neuralgia are numerous. They may be either constitutional or local. There may be some source of irritation, or an abnormal condition of the ganglionic cells of the sensory nerves may exist. Depressing influences of all kinds are very apt to produce it; and hysteric temperament may cause a spinal and articular form, while various peripheral irritations give rise to some of the more obscure forms of neuralgia. Among the causes may be mentioned exposure to cold, pressure on the nerve, toxic influences, overwork, and various constitutional conditions, such as rheumatism, general debility, anemia, etc. Neuralgia occurs oftener in association with anemia than any other constitutional condition, and this fact explains its frequency among females.

Symptoms.—Pain is the most important symptom. It is of a spontaneous nature; occurs in paroxysms; runs along the course of the nerve by the nervi nervorum, and is of a darting, burning character. These paroxysms, lasting from a few moments to some hours, may return at regular intervals. Certain tender points exist along the course of the nerve, usually where the nerve passes from a deeper to a more superficial position. These pains are supposed to be caused by sudden explosions in the ganglionic cells in the gray matter of the cerebrum, where all nerve fibers terminate. Other symptoms of neuralgia are numbness, transient hyperesthesia, vomiting, and various vasomotor disturbances.

Diagnosis.—This is usually easy. From organic disease of a part it can be distinguished by the presence of great superficial tenderness; by a hysteric temperament and by the absence of all the other symptoms of organic disease; from inflammation, by the intermittent nature of the pain, by its occurring in hysteric subjects, and by the absence of the constitutional symptoms of inflammation. When inflammation and neuralgia exist together the diagnosis may be difficult. Here the presence of superficial tenderness and a relief of the pain by deep pressure points to neuralgia, while in inflammation there is no tenderness of the surface, and on deep pressure the pain is extreme.

Treatment.—The treatment varies with the cause. If the cause can not be removed, the disease is incurable, although the suffering may be relieved by suitable means. If the patient's general health is poor, then the neuralgia will recur unless he is built up with tonics and general hygienic measures. For the pain, local applications of a sedative nature, such as opium, aconite, belladona or chloroform, are often useful. Some of the newer remedies—antipyrin, phenacetin, or antifebrin—should be tried. These failing, then morphin may be tried, but with care, the patient never being allowed to use the hypodermic needle. Cocain, hypodermically, usually relieves the pain for a time. Acupuncture may be tried,or aquapuncture, i. e., the injection of distilled water beneath the skin. Freezing the part with ether spray often proves useful. The continuous electric current may be used, placing the positive sponge near the seat of pain, and with the negative gently rubbing the neuralgic spot until the skin is slightly reddened, and until it causes a slight tingling or burning, but not pain. In the most intractable cases the surgical means that may be tried are nerve-stretching or excision of a portion of the nerve. Of the two operations the latter is to be preferred, but too often the pain returns after it. In fact, the operation can only be of use when the pain is peripheral, due to some irritation existing between the part cut and the ends of the nerve. If the neuralgia depends upon any central cause, or if the irritation exists higher up than the point divided, the operation has always eventually failed, although at times a temporary cessation of pain for a few weeks has occurred.

MUSCULAR TIC.

Muscular tic, also known as "histrionic spasm," is an almost incessant twitching of the facial muscles. It often prevents sleep, and at all times causes great annoyance to the patient. As for its etiology, it is thought that some form of irritation of the facial nerve, the nature of which is yet unknown, acts as a

causative agent. At times this disease is associated with neuralgia of the fifth nerve. In the severer cases the nerve should be stretched. This operation when properly done, causes complete paralysis of the muscles of the face, which lasts a longer or shorter period, according to the force used in stretching. As the nerve recovers its function, however, there is always more or less return of the twitching, so that this operation must be looked upon as a relieving agent merely, and not as a curative one. The operation may be performed as follows: Make a curved incision just behind the ear from the root of the mastoid process to about the level of the angle of the jaw. Next, carefully clean the anterior border of the mastoid process and the edge of the tendon of insertion of the sterno-mastoid muscle. Now turn the parotid gland forward. Crossing the wound at about right angles will be seen the border of the digastric muscle, and parallel to it the nerve emerging from the middle of that part of the mastoid process which is exposed. As the internal jugular vein is in close proximity, great care must be used in cleaning the nerve; when once clear it should be firmly stretched with two blunt hooks.

TRAUMATIC PARALYSIS.

This may be brought on by one of three causes: Injury of brain, injury of cord, or injury of nerves. When due to cerebral injury it may vary from a localized paralysis to a hemiplegia. When due to injury of the cord it varies from a mere impairment of sensation and motion to complete paraplegia, with loss of sensation in the paralyzed parts.

Treatment.—If possible remove the cause of the paralysis, e. g., pressure on the brain or cord, and a complete recovery often may be speedily brought about. In treating any paralysis, we should, if possible, restore the muscles to their usual activity as soon as can be. The tendency to atrophic and other changes should be counteracted. Always see that a paralyzed part is warmly clothed, kept clean and not unduly pressed upon. Passive motion of joints along with attempts at voluntary movements proves very beneficial. Electricity, however, gives the best results in paralysis. It increases the vascularity of a part; improves the nutrition of muscles, nerves and other structures; prevents, retards or removes spasmodic contractions, and it seems that the long-continued use of electricity improves the nutrition of the part of the nerve-center from which the nerve or nerves which supply the affected muscles originate, thus restoring the function of a muscle or nerve when its activity is impaired and thereby bringing about restoration of voluntary movements.

TRAUMATIC NEURITIS.

This may be a result of any injury of a nerve, but generally arises from bruises or strains and is sometimes connected with gout or rheumatism. It is rarely found in amputation stumps unless union has taken place by second intention with unhealthy inflammation and suppuration, thus pressing on the bulbous end of the nerve and causing great pain and muscular spasm. The disease is really a chronic inflammation slowly ascending the nerve, and extending in extreme cases to the cord, giving rise to sclerosis. The symptoms of traumatic neuritis are intense pain and tenderness in the line of the affected nerve. Usually there is weakness or paralysis of some of the muscles supplied, but in some cases there are spasms. There may be an intense neuralgic pain in the parts supplied by the nerve in some cases; in others, there may be numbness, tingling or anesthesia.

Treatment.—The treatment consists of operative and non-operative measures, milder cases being treated without operation. The tender nerves should be freely blistered and the nerve kept at rest. Great relief is afforded in some cases by a long strip of capsicum plaster applied along the line of the nerve. Constitutional conditions must be treated by suitable remedies. Electricity in the earlier stages of the disease not only is of no use, but may do positive harm. In cases where all these milder efforts have failed, the operations which may be resorted to are three in number: 1, excision of the bulbous ends of the nerves; 2, division or excision of part of the affected nerve; 3, nerve-stretching.

1. Excision of the bulbous ends of the nerves.—In some cases where a painful stump is caused by the nerve being implicated in the cicatrix, relief may be given by this operation. In other cases, where the symptoms are due to chronic ascending neuritis, the operation, although giving relief for a time, must fail to produce a cure.

2. Division or excision of portions of the nerve.—The smaller nerves are often divided or partly excised in cases of persistent traumatic neuralgia, and as a last resort in extreme cases, portions of the larger nerve trunks have been excised. These operations in some cases give a perfect cure; in others only temporary relief. At times a section of the whole brachial plexus does good.

3. Nerve-stretching.—As stated while considering the treatment of sciatica, this operation acts beneficially by stretching the sheath in which the nervi nervorum ramify. This stretches or tears the nervi nervorum so as to render them insensible to pressure upon them of inflammatory exudations and new connective tissue.

NEUROMATA.

A neuroma is a tumor situated on a nerve. There are two classes of neuromata: the true, consisting of a nerve substance proper, and the false, made of fibrous tissue. A true neuroma is generally made up of nerve fibers only, or very occasionally of ganglion cells. A false neuroma, also a fibroma, is made up of white fibrous tissue, the nerve fibers, as a rule, being stretched over it, or passing along one side, very seldom being involved in the tumor mass proper. A fibroma which springs from the epicœurium is by far the commonest form of neuroma. The tubercula dolorosa are small, painful, subcutaneous nodules. Some authorities consider these growths as true fascicular neuromata, while others look upon them as fibromata, and it seems to have been pretty clearly proven that they are not always made of nerve fibers. By far the most interesting form, however, is the plexiform neuroma, in which several hundred tumors are found on the various nerve cords. In one celebrated case, over 1100 distinct tumors were found on the nerves of the body. These cases are usually of congenital origin. Traumatic neuromata may follow a wound or partial division of a nerve. Of course more or less of a bulbous enlargement must be looked for normally on the central end of every divided nerve and will usually cause no trouble. Sometimes, however, the growth becomes too large, becoming excessively tender, and causing the most intense neuralgic pain.

Treatment.—Unless causing inconvenience by the pain it causes or by its bulk, a neuroma should be let alone. Excision is the only available treatment when it becomes necessary to do something to relieve the patient. Complete relief usually follows the excision, but amputation of neuromata often recur. In excising, if possible, remove the tumor from the nerve without cutting across it. This can generally be done. If not, then try and save a few fasciculi, which will preserve the continuity of the nerve and hasten the restoration of its functions. Where complete division is necessary, try and suture the divided ends, but even when this can not be done, restoration of function sometimes occurs.

TETANUS.

Tetanus is an infectious disease marked by tonic spasms of the voluntary muscles with distinct exacerbations. These contractions may be confined to the muscles of the lower jaw (trismus), or to certain other groups of muscles, or they may involve the muscles of the whole body. Tetanus may occur at any age. It is often epidemic among children, when it is known as trismus neonatorum. Males suffer oftener than females by about four to one. This disease is caused by a specific bacillus—the tetanus bacillus, first discovered by Nicolaier, and first obtained in pure culture by Kitasato. This bacillus is motile, grows at ordinary temperatures, forms a slender rod with rounded ends and may grow into long threads. The requirements of Koch's postulates are fulfilled by this bacillus, which is present everywhere, in surface soil and dust. This fact explains why it is that wounds which have been infected by dust or earth are so often followed by tetanus.

Morbid anatomy.—The anatomic changes in tetanus are slight indeed, when one considers the severe symptoms. There are no characteristic pathologic changes found in the brain, cord or neighboring peripheral nerves, only an extensive proliferation of cells being observed on microscopic examination.

Symptoms.—About the first to be noticed are a slight stiffness of the neck, tightness about the jaws and difficulty in mastication. At times a chilly feeling or actual rigors have preceded these symptoms. Tonic spasms of these parts now occur, the condition being popularly known as lockjaw. As the disease progresses, the features become fixed or convulsed from time to time, the angles of the mouth are drawn up, causing a sardonic grin—risus sardonicus. As the disease advances spasms of the voluntary muscles occur, which cause very severe pain. The muscles of the back are usually attacked next in order of frequency after the muscles of the face. The body is bent backward so as to form a complete arch—the patient resting on the heels and head, a condition known as opisthotonos. The rectus abdominalis muscle has been torn in the spasm. Sometimes the condition known as arthotonos, in which the entire body is perfectly rigid, may occur. Less often the body is drawn forward—emprosthotonos—and still more rarely to one side—pleurosthotonos. The slightest irritation is enough to bring on a spasm, in which the most distressing pain is felt. Profuse sweating usually occurs during a paroxysm. The temperature in some cases is normal throughout; in others there is a marked pyrexia from the outset, the temperature reaching 105 or 106 degrees before death, and being 109 or 110 degrees, and even higher, soon after death. When death occurs it is usually due to exhaustion from the frequent tetanic spasms, but sometimes death occurs during the paroxysm due to heart failure or asphyxia.

Diagnosis.—In well-developed cases it is easy. From strychnin poisoning it may be told by the fact that there is no rigidity, and that the jaw muscles are never involved early, if at all. In hydrophobia there is no stiffness of the jaws, and in the paroxysms the muscles of the neck and back are not affected.

Prognosis.—In all cases the prognosis is grave. The mortality in the past has been about 75 per cent. According to Hippocrates if patients live past the fourth day they usually recover. Favorable indications are: absence of fever, late onset of the attack and localization of the spasms to the muscles of the face and neck. From recent results it would seem that the death-rate in cases of tetanus in the future will be very much lowered by use of the tetanus antitoxin.

Treatment.—The treatment is both local and constitutional. The local treatment aims to bring the wound into as healthy a condition as possible. This must be done by thorough cleansing and swift antiseptic measures. The local treatment is of the highest importance, from the fact that the toxic agents are produced by the bacilli at the seat of injury. Tillmans recommends the use of the 1 per cent. solution of nitrate of silver, which destroys the bacilli and the spores very rapidly and certainly in one minute. It is doubtful if any good is obtained by nerve-stretching. I now wish to speak of the constitutional treatment. This consists of general measures and a specific one. We must try and remove all irritation and support the patient's strength by plenty of nourishment, as tetanus is a disease causing profound shock and debility. Have bowels and kidney active. Keep patient in a dark room with one attendant. Feed patient by catheter passed through the nose when necessary. Nutritive rectal injections may be used. Spasms are greatly relieved by chloroform given at repeated intervals, but it is more satisfactory to keep the patient thoroughly under the influence of morphin given hypodermically. Spinal irritation is greatly relieved by ice along the whole length of the spine. The ice can usually be left on for six or eight hours, but as it is such a powerful depressing agent, the condition of the patient must be closely watched. Many drugs have been lauded for use in this disease. From a physiologic standpoint, calabar bean is the drug that deserves the most attention, as it is antagonistic to the tetanic spasms caused by strychnin. It has, however, proven not to be a specific for tetanus. Extract physostigmatis, $\frac{1}{4}$ gr. should be given every hour until complete contraction of the pupil occurs, and this must be followed by stimulants to counteract the resulting depression. The London *Lancet* recently reports a case caused by the use of this drug.

Specific treatment.—This consists in the use of the antitetanic serum. I firmly believe, from results I have seen and from recent reports published, that any physician failing to use this remedy in a case of tetanus is guilty of criminal negligence. As a rule about 15 c.c. given twice a day, if necessary, will suffice. Every case will be a law unto itself. I believe, further, that we should use this serum as a prophylactic measure in cases where we have reason, from the nature of the wound, to fear that tetanus will follow. Having always found them reliable, I very much prefer the serums produced by Parke, Davis & Co. The conclusions I arrive at are:

1. Sciatica, often called a neuralgia, is generally a neuritis or a perineuritis.

2. The pain in neuritis is due to the pressure on the nervi nervorum, and therefore nerve-stretching is very beneficial.

3. Neuralgia, while it may occur in any part of the body, most commonly affects the fifth cranial nerve.

4. Neuralgia in very many cases is associated with anemia.

5. We should use electric treatment in cases of traumatic paralysis.

6. Antitetanic serum should be used as a protective agent in doubtful cases.

7. The mortality in tetanus will be very much lowered in the future.

ECHINOCOCCUS OF THE LUNGS.

Presented to the Section on Surgery and Anatomy at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY CARL BECK, M.D.
NEW YORK CITY.

As is generally known, echinococcus disease is produced by the tænia echinococcus, a parasite whose domicile is in the intestines of the dog, sometimes perhaps also of the cat. Its length is four millimeters. It has four joints, the posterior of which is larger than the remaining three together. The implantation of this parasite causes the formation of hydatids, which grow into cysts and secondary proliferative cysts in various organs of the human body, particularly the liver.

The knowledge of the echinococcus disease dates as far back as to the time of Hippocrates, who described a "*jecur aquâ repletum*" which would open into the abdominal cavity. The same author speaks of an operation on an echinococcus cyst, before which operation adhesions between abdominal wall and cyst should always be produced by the use of artificial moxæ. The true parasitic origin of the disease, however, was not demonstrated until Göze, in 1782, recognized the characteristic heads and hooklets of the tænia.

The echinococcus disease is found in all parts of the world; yet with the exception of Iceland, some parts of Australia (Victoria and Tasmania) and the vicinity of Irkutsk, Russia, where it is endemic, it is but rarely observed. Especially rare is the echinococcus disease in this country, which explains fully why the American literature on this most interesting subject is so very scant.[1]

The predilection of the echinococcus for the liver is quite natural. The vena portæ leads it by the shortest and broadest route, just as it carries the pyogenic embolus from an infected focus. The echinococcus is found much less frequently in other organs, for instance in the medulla of bones, the pleuræ, the spleen, the intestine, the heart, and still more rarely in the lungs. The literature of echinococcus of the lung is so meager that the following report may deserve record:

An Austrian, 38 years of age, 7 years in the United States, with the following family history: His father died when 61 years of age, from pneumonia; his mother of a brain lesion at 71; a sister died of tuberculosis of the lungs; five brothers are alive and well. The patient never had much association or contact with dogs or cats. About six years ago he had an attack of pleurisy with effusion. He was at first treated medically, and later the serous fluid was aspirated. After a slight improvement, lasting about nine months, he was taken sick again. This time he coughed violently, the expectorations containing much blood. He was treated then for consumption, and was refused admittance at several hospitals, on the ground of the diagnosis. At last he was admitted to a home for consumptives.

About two years ago a slight swelling under the right angle of the scapula appeared, and in the course of about four weeks it became slightly painful; sero-pus was revealed on incision, and some improvement followed, but the cough, accompanied sometimes by vomiting, persisted as before. At last the expectoration became fetid, and the house physician, while examining the sputa for tubercle bacilli, detected hooklets and fragments of cyst-wall; the diagnosis of gangrene of the right lung, caused by the invasion of the echinococcus, was made, and the patient was sent to St. Mark's Hospital for operation. It may be added that jaundice was never present.

Nov. 22, 1897, when I saw the patient for the first time, I found the following conditions: A tall, emaciated man; a flat thorax, which expands symmetrically; the left lung is normal, but on the right side, anteriorly and below, there are tympanitic sounds, and also râles during inspiration; posteriorly and below there is slight dulness; correspondingly, bronchial breathing and râles are found; the heart is normal; pulse 106, temperature 100.5 F.; the urine contains indican. The patient suffers intensely under vehement coughing spells, especially in the morning, which are always followed by expectorations of a most offensive odor. Sometimes there is dyspnea and also hemoptysis. The sputa amounts to about 200 c.c. in twenty-four hours, and contains pus corpuscles in abundance. There are fibers of the characteristic alveolar type, pigment, hematoidin crystals, disintegrated blood corpuscles, phosphate crystals, streptococci and leptothrix. Neither the bacterium coli commune, which was particularly looked for, nor the tubercle bacillus, could be discovered, nor were any hooklets or cystic fragments found. When the patient expectorates little, the dullness posteriorly is more pronounced, and the respiratory sounds are less audible than in the morning after copious expectoration. Then the bronchial respiratory sounds become more pronounced, again above the region of the fifth, sixth and seventh ribs, where sometimes amphoric breathing can also be perceived. Diagnosis: Lung cavity, caused by gangrene, induced by the invasion of tænia echinococcus.

November 24, after the usual aseptic precautions, pneumotomy was performed. In view of the weak pulse of the patient digitalin had been administered during the last forty-eight hours, and a saline infusion twice during the last twenty-four hours. Chloroform was given carefully. An incision reaching from the middle axillary line to the transverse process of the sixth dorsal vertebra was made, directly down to the bone, and by keeping the edges of this wound far apart it was possible to expose the fifth and seventh ribs, which now, together with the sixth, were resected. After a portion of the soft tissues also, with the costal pleura, was removed, the lung collapsed slightly, but soon assumed its former expansion. The edges of the cavity being well protected with sterile gauze, a strong aspiratory needle was pushed forward into the center of the exposed area, which yielded blood only. After various efforts in different directions were made in vain, the stylet tip of a Paquelin's cautery (such as I have advised in former publications on the technique of the operation for abscess of the lung, (Forty-eighth Annual Meeting of the AMERICAN MEDICAL ASSOCIATION), was introduced carefully into the center of the exposed area. After a little over an inch of the lung tissue had been perforated, a stream of rust-colored pus of a most offensive odor escaped with a loud noise, and at the same time the patient collapsed rapidly. A sponge was quickly forced into the opening, and under artificial respiration and energetic stimulation the patient rallied. On the following day the cavity was carefully washed, and much pus and detritus discharged, and it was drained by a large rubber drainage-tube, surrounded by iodoform gauze. The secretion was copious during the next four weeks, but its repeated microscopic examination revealed nothing extraordinary.

During the first week after the operation the temperature varied between 99 and 101 F., while the pulse was 90 to 100. The patient slept but little, and was tortured by coughing spells which were nearly as violent as formerly. The respiration on an average was from 30 to 36. As it seemed that there was some retention, probably due to the irregularity of the draining canal, I introduced my finger into the cavity, dilating

[1] Besides this case I had a chance but once to operate upon another echinococcus. It concerned a man aged 34 years, a German by birth, who had resided in this country for eight years and who also denied any particular correlation to dogs. The patient had shown an enlargement above the anterior surface of the liver. No jaundice. Several times a light serous fluid was aspirated, which, although a faulty procedure, was always followed by a slight improvement. May 26, 1892, he submitted to laparotomy at St. Mark's Hospital. Recovery was speedy and perfect.

it thoroughly: a large quantity of bloody pus was discharged again, and by a violent cough a thick membrane, rolled together like a cigarette, was expelled, which proved to be a piece of a cyst-wall. The patient now improved steadily, the discharge lost its odor and became very much less in quantity, and the temperature, pulse and respiration became normal. On February 6 the tube was discarded, and on February 21 the wound was found healed. All the patient complained of now was a sharp pain, which extended into the epigastrium when he tried to inspire deeply. Pressure above the large curvature caused considerable pain, so that when hyperacidity and nausea was noticed, a stomach ulcer was thought of, although no hematemesis was present. The treatment of these symptoms showed no result. The more the retraction of the large scar proceeded, the less intense these pains became, and so it was evident at last that the pain was caused by the process of scar formation in the lung tissue, during which the diaphragm, which undoubtedly had become adherent in the course of the disease, was drawn upward in this vicinity. Under the use of respiratory gymnastics and electricity these attacks disappeared slowly, and the patient was discharged cured June 20, 1898.

Whether the original implantation of the parasite in this case took place in the lungs (primary echinococcus of the lung), or indirectly from the pleura or liver by slow perforation, is not fully evident from the previous history. While the localization of the abscess, which had been incised two years ago, might slightly be looked at in favor of an origination in the liver, the symptoms of an affection of the lungs were predominant from the early beginning of the disease. That well-pronounced symptoms were absent for a long period, could be explained by the slow growth.

A resumé of the diagnostic points may be condensed as follows: 1. Whenever the symptoms of a chronic affection of the lungs become apparent, and pneumonia, circumscribed effusions, pyothorax and infectious diseases (particularly tuberculosis) can be excluded, the possible presence of echinococcus should be thought of, especially so when at a later stage there is violent cough and expectoration of blood and pus of a most offensive odor. 2. In those rare cases where the examination of the sputa fails to show the characteristic elements of the parasite, it should be considered that at the early stage of primary echinococcus the lines of dulness are irregular according to the shape of the cysts, and sharply pronounced, while later on, when it comes to the formation of an abscess cavity, they are replaced by tympanitic sounds. Accordingly there is also no abnormal temperature at the beginning, while later on the characteristic irregular temperature-curve points to pus retention. 3. Sometimes there is an expansion of the thoracic wall and a dilatation of its veins. If the abscess wall approaches the chest wall, bulging of the intercostal spaces becomes noticeable.

From this case we learn that the diagnosis of echinococcus of the lung is usually difficult. Its rarity prevents its general and thorough study, but it can fairly be assumed, on the other hand, that it is more frequent than is supposed, because on account of its difficult recognition it is often taken for a different disease. With our better means of investigation and our greater zeal, this disease will in the future be more frequently detected, and pneumotomy, the only proper therapy, will be more often resorted to.

RECENT EXPERIENCES IN MILITARY SURGERY AFTER THE BATTLE OF SANTIAGO.

BY N. SENN, LIEUT. COL. U. S. V.
CHIEF OF THE OPERATING STAFF WITH THE ARMY IN THE FIELD.

(*Concluded from page 1171*).

Case 18.—Scanlon, Company K, Third Cavalry, was wounded on the second day of the battle of Santiago. The ball entered the chest through the third rib midclavicular line on the right side, passed downward and backward and escaped in the gluteal region on the same side, after perforating the ilium (Fig. 21). The ball must have passed through the lung, diaphragm and liver. Hemoptysis slight, but distressing nausea, vomiting and pain. Admitted to the hospital ship *Relief* July 15. At that time he had a constant temperature ranging between 100 and 102 degrees F., vomiting, diarrhea and rapid emaciation. Great pain over the liver and ascending colon. Hemothorax and marked swelling in the region of the liver and abdominal cavity on the right side. Examination of urine negative. Owing to the great debility and pronounced anemia it was not deemed advisable to resort to laparotomy.

Case 19.—Harry Mitchell, Company C, Seventh Infantry, was wounded July 1. The bullet entered over the right acromion process, passed through the apices of both lungs and escaped through the second intercostal space above the right nipple (Fig. 22). No hemoptysis at any time, dry cough and a moderate hemothorax on the right side. Has suffered from

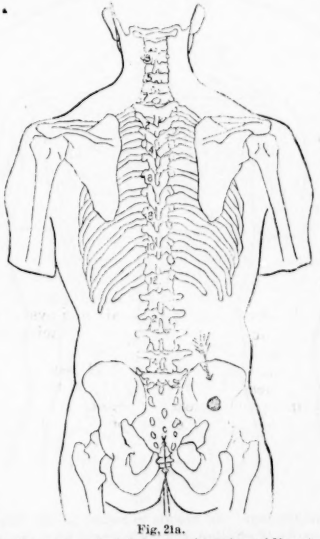


Fig. 21a.

quotidian form of malarial fever, which is yielding to quinin. A speedy and complete recovery is expected.

Case 20.—Lieut. John Robertson, Company G, Sixth Infantry, received a gunshot wound of the upper third of right thigh about 10 o'clock July 1. The profuse hemorrhage was partly controlled by an improvised tourniquet applied by an officer of the line. He was carried to the rear by the men of his company, and while thus conveyed he was shot in the left breast, the bullet entering just below the left nipple and passing through the chest in an antero-posterior direction (Fig. 23). He was wounded a third time, the bullet grazing the inner side of the left knee. The first dressing was applied in the First Division Hospital. The fracture of the thigh was dressed by the use of a long splint. From here he was sent, on July 9, to the Third Division Hospital, and two days later was brought on board the *Relief*. At this time both chest wounds were healed. The thigh wounds remained aseptic. A radiograph showed great displacement of the fragments by overlapping. The fracture was then treated by confining the limb upon a

double-inclined plane, consisting of a hollow posterior splint made of the sheath of the leaf of the cocoa palm, to which was added an anterior thigh splint of wire gauze. After dressing, the limb was placed in a sling. No pulmonary or pleuritic complications.

Case 21.—Henry T. Darby, Company D, Thirteenth Infantry, received a perforating gunshot wound of the chest July 1. The ball entered on the right side, above the angle and at the outer border of the right scapula, passed through the chest and escaped through the fourth intercostal space in front, on the opposite side, two inches outside of the mammary line (Fig. 24.) When the patient came on board the *Relief*, July 9, he complained of great difficulty in breathing; he was pale and greatly prostrated; temperature 102 degrees F. The physical signs indicated the presence of a copious pleuritic effusion on the left side. The chest was opened by an incision through the sixth intercostal space, in the axillary line, July 11. About three pints of fluid blood escaped. Gauze drainage. The lung expanded rapidly and the patient commenced to improve.

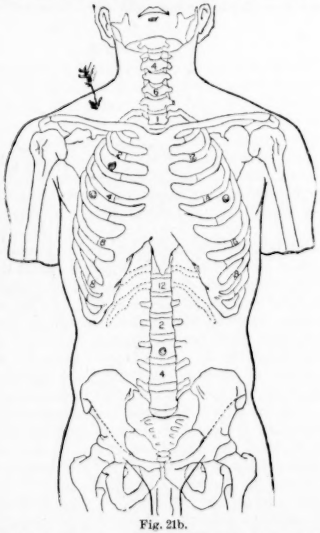


Fig. 21b.

No further doubt can remain in regard to the difference in the mortality of gunshot wounds inflicted with the large and small caliber bullets. The cases related above appear to prove that the danger incident to gunshot wounds of the chest made by the small projectile, consists in complicating injuries involving the heart and large blood-vessels, and that in the absence of such injuries the prognosis is favorable. It seems that empyema is a rare remote result of such injuries. Rib resection and free incision and drainage of the chest in such instances must be reserved for cases in which a positive diagnosis of empyema can be made. The safest and best treatment for hemothorax requiring operative interference is tapping and evacuation by siphonage.

GUNSHOT WOUNDS OF THE ABDOMEN.

Our recent experience in Cuba has more than ever confirmed my conviction that not infrequently cases of penetrating gunshot wounds of the abdomen will recover without active surgical interference. For years I have maintained, as the result of clinical experience and experiments on the cadaver, that a bullet may pass through the abdomen on a level and above the umbilicus in an antero-posterior direction without producing visceral injuries demanding operative intervention. Elsewhere the results of my experience and experimentation concerning such injuries have been published. If the bullet traverses the small intestine area it is more than probable that from one to fourteen perforations will be found.

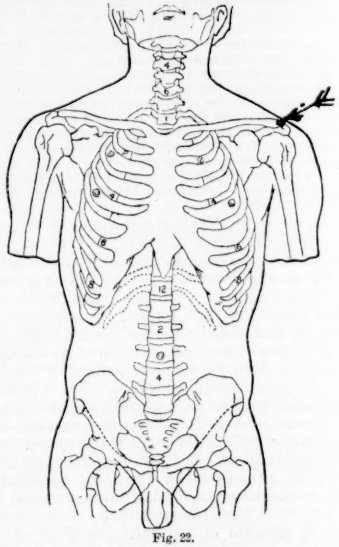


Fig. 22.

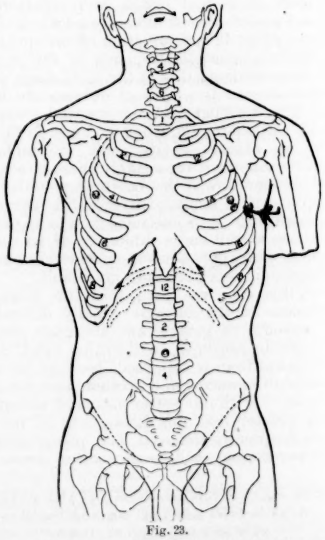


Fig. 23.

Four laparotomies for perforating gunshot wounds of the abdomen were performed in the First Division Hospital, the only ones, to my knowledge, during the Cuban Campaign.

All of the patients died. This unfavorable experience should not deter surgeons from performing the operation in the future in cases in which from the course of the bullet it is reasonable to assume that the bullet has made visceral injuries which would be sure to destroy life without surgical interference. In other cases the employment of diagnostic tests for the purpose of demonstrating the existence or absence of intestinal perforations will enable the surgeon to decide what course to pursue. Abdominal section is always justifiable in cases of internal hemorrhage sufficient in amount to threaten life.

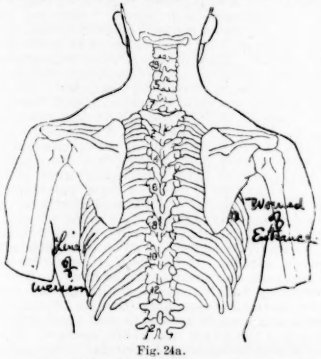


Fig. 24a.

A number of cases of gunshot wounds of the abdomen have been related in connection with gunshot injuries of the neck and chest, in which the cavity of the chest and abdomen and their contents were implicated at the same time, and which are on the way to recovery without laparotomy having been performed. I have seen a number of cases of perforating wounds of the abdomen in the First and Third Division Hospitals that were on a fair way to recovery without operation before they were sent home on transport ships. In most of these instances the bullet wounds were either in the umbilical

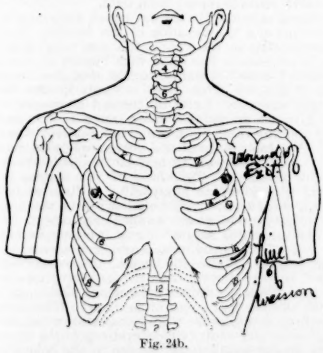


Fig. 24b.

region or one of the iliac fossæ. The following case presents features of more than usual clinical and surgical interest:

Case 22.—J. F. Taylor, Company D, Tenth Cavalry, was wounded July 2. At the time the injury was received he was in the ventral prone position. The bullet entered the left shoulder in the infraspinatus fossa one inch below the spinous process of the scapula, and passed downward and inward and lodged under the skin in the median line, two inches above the umbilicus (Fig. 25). Hemoptysis considerable during the first day, when it gradually subsided. He complained of great pain and tenderness in the right side of the abdomen. No vomiting or symptoms of more than a circumscribed peritonitis. An abscess formed in the abdominal wall, which was opened July 20, and the bullet was removed. From this time on the patient improved rapidly.

GUNSHOT WOUNDS OF THE EXTREMITIES.

It is a source of gratification to know that very few primary amputations were made for gunshot injury of the extremities. All of the surgeons realized the importance of conservative measures in the treatment of such injuries, and limited amputation to cases in which the condition of the soft tissues precluded such a course. A number of secondary amputations became necessary to save life in cases of infected compound fractures, usually complicated with injury and infection of the adjacent joint. Two cases of traumatic aneurysm are now on

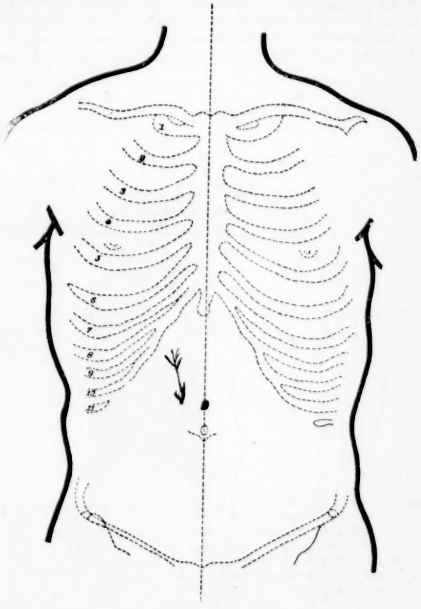


Fig. 25a.

board the *Relief*, one an aneurysmal varix, the other an aneurysm of the femoral artery.

Case 23.—Captain Mosher, Company G, Twenty-second Infantry, received a bullet wound July 1, during the advance on Santiago. Those who saw the patient first assert that the hemorrhage was severe, and that the patient lost consciousness. He was removed to the First Division Hospital and transferred July 10 to the Third Division Hospital, and the following day he was brought on board the *Relief*. I examined the patient at the front five days after the injury and confirmed the diagnosis made by the attending surgeons, who had recognized the anatomic nature of the aneurysm.

The wounds healed by primary intention in less than two weeks. One wound is in the middle of Scarpa's triangle and the other at the level of, and one inch posterior to the great trochanter on the same side. From the fact that there is, as shown by the radiograph, a piece of the jacket of a bullet in

the right popliteal space, it is probable that he was wounded by a plunging fire and that the bullet inflicted the latter wound after emerging from the wound in Scarpa's triangle. The wound in the popliteal space is suppurating. Patient is very anemic and weak. In the triangle directly under the wound there is a pulsating swelling in the direction of the femoral vein, which extends to Poupart's ligament. Fremitus and the characteristic bruit extend a considerable distance above and below the communicating opening between the artery and vein. The treatment consists in rest and tonics. General health of the patient is improving, but there is no change in the local condition. The mental condition much impaired since the injury is gradually improving.

Case 24.—John J. Welch, Company M, Second Massachusetts Volunteers, was wounded July 1. The bullet entered the middle and back of Scarpa's triangle, three inches below Poupart's ligament, directly over the femoral artery, and escaped at a point corresponding with the gluteal crease and to the outside of the femur on the same side (Figure 26). Not much hemorrhage. A well-marked aneurysm developed,

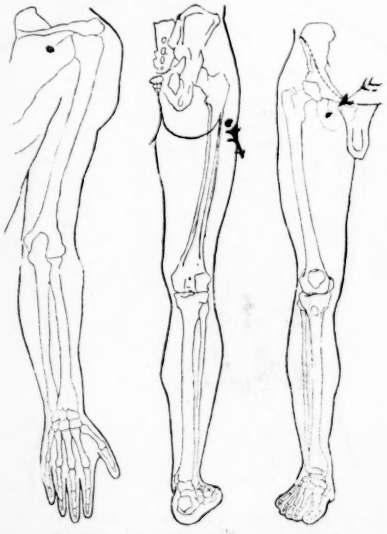


Fig. 25b. Fig. 26a. Fig. 26b.

presenting all the physical signs characteristic of such a pathologic condition. The swelling is somewhat elongated, a little larger than a hen's egg, and has not increased in size since the patient came on board the hospital ship. The leg is somewhat edematous and painful. A number of gunshot fractures of the thigh and leg have become infected and are now being treated by establishing free tubular drainage and resorting to frequent or continuous antiseptic irrigation. Owing to the want of reliable plaster of Paris, we had to resort to various kinds of splints, single and double inclined plane, in effecting immobilization. The sheath of the leaf of the cocoa palm has served as an excellent material for this purpose. There is every prospect that most of these cases will utimately recover with useful limbs.

In conclusion I desire to thank Acting Assistant-Surgeons Metcalfe, Torney, Greenleaf, Hartsock, Morrow and Schultze for valuable assistance in preparing this communication.

SOCIETY PROCEEDINGS.

Chicago Academy of Medicine.

Regular Meeting, Oct. 14, 1898.

Dr. GEORGE F. BUTLER occupied the chair.

Dr. G. F. HAWLEY of Chicago presented a paper entitled

CHRONIC POST NASAL CATARRH.

He said that the title is applied to a low grade of chronic inflammation located in the post-nasal space. The condition is found at all periods of life, from the nursing infant to the nonagenarian. It is so prevalent in America that it has been entitled by Mackenzie and others "American Catarrh." Whether this prevalence is due to climatic influences or to predisposing factors in those living on this side of the Atlantic, is a mooted question. That post-nasal catarrh may be associated with a neurotic diathesis, due to degeneracy, and also to intra-utero-vaginal states, can hardly be questioned. The functions of life are more or less easily disturbed in such cases, resulting in a predisposition to all types of disease, especially those affecting the glandular system. It is particularly noticeable in the torpid and erethistic types of the tuberculous diathesis, characterized by very light or very dark hair, light or dark eyes, a dark, pallid or light complexion, much perspiration, small blood-vessels, slow, feeble or rapid pulse, and want or excess of energy in mental and physical functions. Nowhere is there a richer supply of glands than in the post-nasal space, hence this is naturally affected early by the condition mentioned. In nearly 90 per cent. of all chronic catarrh the post-nasal space is affected. It has been claimed that a perfectly healthy post-nasal space can hardly be found in this country. The far-reaching baneful effects of this disease can not be questioned, since many secondary disorders affecting the upper air-passages and bronchi are due to post-nasal catarrh. It is the *bête noir* of the singer and public speaker. It is the frequent cause of suppurative and catarrhal inflammation of the middle ear both in the young and old. It is a strong factor in producing deafness in after life. This constant state of inflammation disturbs the circulation, and by causing congestion and hypertrophy of the turbinates, prevents free drainage and obstructs to a greater or less degree the passage of air through the nose.

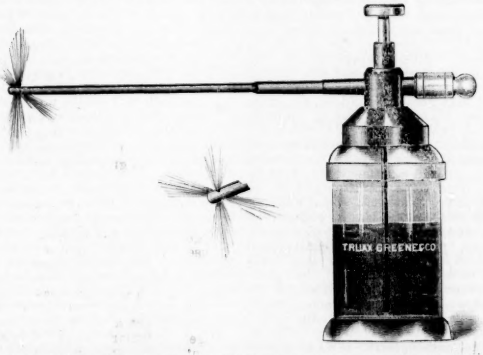
The causes of this disorder are divisible into predisposing and exciting. Judging from the extensive and early manifestations of this disease, the predisposing causes are inherited or congenital, from maternal leucorrhea, etc. The exciting causes are sudden changes of temperature, and diseases affecting the upper air passages, such as measles, scarlet fever, diphtheria, etc. The symptoms are so well known that it is hardly worth while to repeat them here.

The clinical aspect of the disease varies according to the age of the patient and the duration of the trouble. In the early stage, particularly in the young, the post nasal space is frequently found more or less filled with masses of tissue, giving to the touch a sensation similar to that of angleworms (adenoid growths of Meyer). This mass is easily broken down and exceedingly vascular. Later on, instead of masses of tissue, isolated growths or nodules occur, more or less evenly distributed over the vault, distinct and independent of each other. These, in the early stage of the disease, are also exceedingly friable. Later these growths become fibrous in character and are difficult to remove. This form of the disease is usually associated with granular pharyngitis. Often, as in cases of old chronic suppurative inflammation of the middle ear, the mucous membrane appears swollen and soggy, seemingly soaked with mucus or serum. Again the mucous membrane, though generally healthy in appearance, presents, in the median line, folds of hypertrophy tissues. These are parallel to each other and run upward from behind the soft palate to the vault. In all these conditions the mucous membrane is highly congested, causing that sense of fullness so distressing to the sufferers from this disorder. He has also found at the median line and near the vault, single cystic growths or swellings about the size of a split bean, smooth to the touch and with the sides gradually running into the adjacent mucous membrane. This is easily destroyed by the finger, exposing a pocket-like depression with smooth and hard walls. Occasionally the mucous membrane is covered by highly vascular granulations, which, though hardly visible on examination, give to the finger a sensation as if passing over velvet or plush. All these abnormal conditions not only prevent a cure, but cause the many distressing symptoms associated with this form of the disease. The importance, therefore, of a thorough examination and treatment of the post-nasal space in all catarrhal affections of the upper air-passages can not be too

strongly urged upon the profession. In no other way can the practitioner expect to accomplish any permanent good, as here lies a strong factor of causation.

The prognosis is good if seen in time and treated properly. If not, the condition gradually grows worse, affecting the neighboring parts and producing ear complications and finally inflammation of the pharynx, larynx and bronchial tubes. Due to disturbance of circulation, the nose becomes gradually closed by thickened mucous membrane, until its natural function is almost entirely destroyed, causing mouth-breathing with all its ill effects.

The treatment is constitutional, surgical and medicinally local. Constitutional treatment depends upon the condition of the individual. It should tend to the building up and supporting of the general health. But few cases of post nasal catarrh can be cured or even relieved without surgical interference, the removal of all outgrowths and diseased tissues. Local applications, in whatever way applied, are for thoroughly cleansing and stimulating the parts affected. Up to the present time attempts to cleanse and medicate the post-nasal space have proven unsatisfactory. The anatomic relations of the parts are such that to thoroughly cleanse and medicate the diseased tissues by any instrument in use is practically impossible. It is due to this fact, more than to the obstinacy of the disease, that a larger percentage of cures does not result. The spray is the best means to accomplish this end. As generally used by the profession, it is open to serious objections. While the atomizers furnished by the instrument makers may thoroughly cleanse the anterior chamber of the nose and the pharyngeal walls, they can force but little medicament into the post-nasal space in the form of spray. The spray soon becomes



a stream which flows along the inferior meatus until it falls either into the phaynx or, by the aid of the soft palate, passes out into the adjacent nostril. On account of the extreme sensitiveness of the mucous membrane lining the nasal passages, the practitioner is, moreover, restricted in selection of medicament and in its strength. Silver nitrate, for example, one of the best remedies in treating post-nasal catarrh, can be used, if at all, only in very weak solution, on account of the strong reaction produced in the nose. The nose, whether healthy or diseased, must receive the full effects of all medicament intended for the post-nasal space alone. If the attempt be made to spray back of the soft palate, the time allowed for the treatment is so short, from gagging of the patient, that but little effect can be produced upon the diseased tissues. The same objection exists to the use of powders. The brush is not only disagreeable to most patients, but gives unsatisfactory results as well.

One object of this paper is to bring to notice an improved instrument which overcomes many of these difficulties. It is so constructed that it can be inserted through any nostril, no matter how small, until it reaches the post nasal space, where a medicament, by means of a spray, can be applied directly and forcibly against the entire diseased surface. The strength of the medicament is graduated by the amount of spray used, which again is gauged by means of a small set-screw at the head of the bottle containing the medicament.

Dr. WILLIAM L. BALLENGER—Dr. Hawley's thesis treats of a condition, the relief of which often baffles the efforts of the rhinologist. The very stubborness of the condition tempts him to devise some new method or instrument for treating it. His new instrument may be good or it may be bad, but in any event he overlooks the etiology and pathology of the condition. He presumes that some medicament sprayed into the naso-pharyngeal space by means of his device, will cure a large percentage of cases so treated. We regard the so-called post-nasal catarrh as a symptom of one or more conditions, which are usually found in the nose. A few instances illustrating the point are: 1. Polypoid degeneration located in the posterior part of the nasal chamber would, by occluding the nares and giving rise to an acrid discharge into the post nares, excite an inflammatory action of a low grade in the mucosa of the post-nasal space. 2. An inflammation of the posterior ethmoidal or sphenoidal cells would give rise to a discharge into the post-nares, thereby giving rise to catarrhal inflammation of the membranes of the parts. 3. Dry rhinitis, rhinitis with collapse, and atrophic rhinitis, diminish or abolish the supply of moisture which is physiologically supplied to the inspired air. The nasopharynx and pharynx attempt to supply the deficiency. Overstimulation results, and we have chronic post-nasal catarrh as a result. 4. Post-nasal adenoids are attended by the same conditions. So one might continue to name conditions which give rise to so called post-nasal catarrh. The point I wish to make clear is that post nasal catarrh must be first thought of as a result of one or more antecedent conditions. After having recognized it as such, we must determine which of them are present in the case under consideration. Having determined the cause or causes we are ready to think of the treatment. If the catarrh is caused by nasal polypi, we may hope for relief by removal of the same. If caused by catarrhal or suppurative inflammation of the ethmoidal or sphenoidal cells, we must cure these conditions before hoping to relieve the post-nasal catarrh. If hypertrophy of the posterior ends of the inferior turbinated bodies exists, we remove them before addressing particular attention to the post-nasal space. And so we can not say any particular method or instrument will cure chronic post-nasal catarrh. When Dr. Hawley says that hypertrophies of the nose disappear after his spray-treatments of the post-nasal space, he certainly is in error. Hypertrophies do not disappear so easily. If an hypertrophy exist, it will only disappear by surgical interference. When Dr. Hawley accuses post-nasal catarrh of causing most nasal disorders, I think he has the cart before the horse. It is a well-recognized pathologic fact that the post-nasal disorder is usually a secondary, and not a primary, affection. I must, therefore, disagree with almost every proposition set forth in Dr. Hawley's thesis. I recognize that chronic post-nasal catarrh is somewhat relieved by post-nasal washing, but I do not believe any considerable number of cures result from such treatment.

Dr. RIES wished to ask Dr. Hawley as to the influence of the maternal parturient canal in producing adenoids in the child as he had understood from the Doctor's paper that the gonococcus of the maternal canal exercised an influence in producing chronic conditions of the mucous membrane of the child leading up to adenoids.

Dr. KIERNAN said that in adenoids two factors had to be taken into consideration—the constitutional condition and the local exciting factor. Adenoids very frequently occurred in degenerates and, all other things being equal, the gonococcus was most likely to be present in the vaginas of degenerate women, or of women who had degenerate husbands. The lat-

est researches on the subject with which Dr. Kiernan was acquainted were those of Dr. O'Toole of San Francisco, which had been reported in the last volume of the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION. The gonococcus was an exceedingly obstinate infector of mucous membranes, and the effects of its presence were certainly conducive to secondary mixed infection by the streptococci and staphylococci. Hence it could be seen that children born of mothers infected by gonococci might not only have contagious ophthalmia, but also nasal and buccal disorders.

Dr. HAWLEY, closing the discussion—Dr. Ballenger is in error when he states that I claimed in my paper that medicaments sprayed into the naso-pharyngeal space by means of my device will cure a large percentage of cases so treated. I did say, however, that but few cases of post-nasal catarrh can be cured or even relieved without surgical interference; also that the anatomic relations of the parts are such that to thoroughly cleanse and medicate the diseased tissues by any instruments in use is practically impossible, and it was due to this fact that a larger percentage of cures did not result. The spray, or some local application, as I expressly stated, constitutes adjuvant treatment. Surgery alone, while it may remove the cause, rarely cures the secondary disease of the mucous membrane. So far as my device is concerned, I simply claim that it offers a superior method of applying such medicaments as may be deemed advisable by the surgeon.

The term post-nasal catarrh, as now used, does not imply a symptom alone, but a disease, a low form of inflammation of the mucous membrane with its many glands and follicles, and presenting various clinical and pathologic conditions, some of which I have herein noted. Whether some or any of these conditions depend upon preexisting trouble in the nose, I neither affirm nor deny. That nasal trouble is often due to preexisting disease in the post-nasal space, I think can at least be conceded. When we note the frequency of the disease, its early manifestations, its baneful effects upon the ear, the throat, and even the bronchial tubes, can we not feel assured that it is also a strong factor in producing trouble in the nose, especially when we see, as I have seen in children, all these conditions—not only in the ear, throat, etc., but in the nose itself—improve by treating the post-nasal space. I think the Doctor is mistaken in his statement that it is a well recognized pathologic fact that post-nasal disorder is usually a disorder secondary to nasal affections, and not a primary one; that is, if he understands post nasal catarrh as I understand it—an actual inflammation existing in the post-nasal space, and not merely a running at the back of the nose due to polypoid or sphenoidal disturbances. Post nasal catarrh can and does exist independently of any nasal trouble, due to constitutional dyscrasia, especially noticeable in the tubercular and weakened type of the Xanthous variety of mankind. That post-nasal catarrh is frequently caused by a lithemic diathesis, as described by Musson, Robinson, Allen and others, I think cannot justly be questioned, and that it is found in the newly-born, through maternal leucorrhea, as described by O'Toole, must also be admitted. "Post nasal catarrh" is a bad term to use, admitting of too many views as to its meaning, but it is the best we have at present. It is due to this fact, I think, that Dr. Ballenger and myself differ so materially regarding the etiology, pathology and treatment of this disease.

Dr. CARL THEODOR GRAMM presented a paper on the subject of

IMPLANTATION OF FOREIGN OBJECTS IN THE MAXILLÆ.

He explained the paper to be a preliminary report of a study of bone degeneration. Its practical side dealt with the possibility of implanting in the processes of the maxillæ, and having firmly encapsuled there, substitutes for the roots of teeth that have been lost by decay, trauma, or pyorrhea alveolaris—substances other than ivory, or roots of living or desiccated teeth, all of which are prone to resorption. The author reviewed the character of the maxillæ and the phenomena of bond regeneration in them and pointed with emphasis to, citing a number of experiments and authorities in support of, the claim that the recuperative forces in this bone are markedly in advance of other bones of the body. He then went on to say: "whether in the presence of a mechanic irritant, a substitute for natural roots such as I will describe below, from this bony structure, rich in resources for repair and readily adaptable to altered conditions, would develop a sclerotic envelope for the substitute, or whether the process would be one of degeneration and sloughing is the question to be weighed. It is a question taking us at once into the field of bone resorption and regeneration, bone inflammation and its sequels." The author cited and criticised the experiments and conclusions of thirty-nine authorities who have studied the phenomena of bone development. His own experiments, which were carried only through the preliminary stages, were performed upon six dogs, and consisted in removing an upper pre-molar in each of them, freely enlarging the socket and implanting an artificial root made of lead, which was held firmly in position by a mechanic device. The apical portions of these lead roots were bulbous, and at their middle were shallow grooves, which, when filled in with fibrous or osseous tissue, would favor their retention. Four of these dogs were killed in from three to six weeks after the operations, and sections of the jaws removed in order to demonstrate the development of new bone under various conditions. As the result of this work, he holds that further experiments, in which sufficient time is to be given for the solidification of new growth, will verify the hypothesis which formed the basis of this preliminary work, to wit, that a mechanic irritant such as he proposed, will under favorable conditions cause a sclerotic envelope to be formed about it sufficiently firm to withstand the pressure from articulating teeth. He seeks an analogy in the chronic osteitis in which no rarefaction of bone occurs; in which new growth slowly ossifies, and the Haversian canals and cancellous spaces diminish—a condition commonly known as osseo-sclerosis. The article was illustrated by photo-micrographs and lantern slides from the author's laboratory.

Dr. EUGENE S. TALBOT—About twenty years ago, Dr. Younger first brought prominently before the profession the implantation of teeth; however, the better educated men of the profession looked upon this practice unfavorably. He claimed that a tooth which had been out of the mouth indefinitely could be cleaned by scraping off the peridental membrane and débris, and disinfected, and, after drilling a hole in the jaw-bone and being implanted, would produce a new peridental membrane, and apparently be as good a tooth as any. He went so far as to state that the tooth of a mummy which had been dead for thousands of years would be implanted into the jaw of a patient at the International Medical Congress, held at Berlin, and that it would grow firm and become useful indefinitely. This was done, but the operation was unsuccessful, the tooth only lasting a few days. Many teeth have been implanted, but a very small number have proven a success. I have never heard of or seen a case where a new membrane had been produced. These teeth have been treated by the system like any other foreign body, and expelled either bodily or by absorption. Therefore, I have never taken kindly to this operation. The essayist has undertaken some very valuable experiments, and I wish to congratulate him upon the work he is doing. Much may be learned from it. He has not, however, brought us any tangible consideration this evening. His work is only fragmentary, and no definite results have been presented. The work is so incomplete that it is hardly consistent to bring it before this body this evening. Such work requires much time and many experiments to give us definite results. I trust he will continue his work and, when complete, give us material of great value.

Dr. A. E. BALDWIN—This is a subject that has been of very great interest to me. I have not made any original investigations myself, and have consequently been more interested in these experiments than I otherwise would be. While congratulating the writer of the paper upon his experimental work, I can not help but agree with the previous speaker in concluding that the experiments are on a line which will not be productive of any great benefit. Ten years ago, in an interview with Dr. Younger, he claimed to me that these operations of implantation of teeth, which are directly in the line of this paper, would be recognized as a great success all over the country in a few years. I told him then, as I say now, that if the principles laid down by Dr. Younger, which are apparently the same as those of the writer of this paper, are true, we shall have to relearn our histology and physiology. Nature sometimes tolerates these foreign bodies simply in a mechanical way, but it seems to me as though we have not evidence of any natural union between the implanted bone or tooth and the alveolar process.

Dr. GRAMM, in closing the discussion—It is true that the work is incomplete and does not present final conclusions. I hesitated somewhat on that account to bring it before this body, but concluded finally, after having found abundant precedent, to do so. I believe it is quite frequently the case that scientific bodies lend an ear to notes of experiments that are preliminary. The criticism which Dr. Talbot passes upon Dr. Younger does not apply to the work under consideration. The resorption of an osseous structure implanted is a probability recognized by histologists fifty years ago. The foreign material implanted in the jaws of these dogs is non absorbent, hence the interest in this work does not center in the fate of the tooth-root implanted, but rather in the degree of toler-

ance exhibited by the osseous tissue of the alveolar process. It has not been proven that the alveolar process in particular, this structure of exceeding vitality, will not tolerate a foreign substance, and no measure of general statement, unless founded upon experiments made directly upon the maxillæ, can be accepted as criticism of undoubted value.

The Second Northern Congress of Internal Medicine.

Held at Christiania, Norway, in August.

This congress gathered a representative assemblage of Scandinavian physicians from the Northland countries, and even one from Scandinavian Chicago.

ORGAN-THERAPY.

REIERSEN reported encouraging results from the use of "testicle extract," especially in tabes, 12 cases rendering morphin unnecessary, but the general trend of opinion seemed to be unfavorable.

SCHIÖDTE of Copenhagen stated that he had been extremely successful with thyroid treatment in obesity, combining it with moderate under-feeding, but plenty of albumin. He declared the profession over-timid in regard to thyroid treatment, and too apt to transfer to obesity the disturbances caused by it in myxedema, which should not be compared with it at all.

FABER called attention to the cutaneous hyperesthesia of certain portions of the abdomen which sometimes accompany gastric troubles, (25 of his cases) but yield to faradization, etc. Others confirmed his experience and warned against the mistake of diagnosing a gastric ulcer from this undoubtedly hysteric symptom.

ARTERIOSCLEROSIS.

Professor EDGREN's address on this subject was based on a study of 124 cases. He found syphilis the most frequent antecedent (age, 40 to 46 years), next alcoholism (age 51 to 53), hereditary, malaria and lead poisoning. No special cause could be discovered in 12 cases, (average age 66) evidently the pure senile form.

Professor RUNEBERG treated the subject from the clinical and therapeutic point of view, classifying arteriosclerosis as: 1, the local or typic syphilitic form, affecting the arteries of the brain or the aorta; 2, granular-atrophy sclerosis of the smaller and medium vessels, with secondary hypertrophy of the heart; and 3, generalized sclerosis of the large and medium arteries—the senile type. He advised prophylactic measures to insure regularity in the functions—diuresis, gymnastics, etc. with potassium iodid continued for several years; tonics, and antisyphilitic treatment as indicated.

Prosector GADE described the anatomic alterations in this affection, which seem to be of a purely degenerative character, suggesting injury to the tissues of a chemic nature.

Professor LAACHE disguted this toxic etiology and attributed the chief rôle to the arterial pressure, citing the rarity of the process in the pulmonary arteries.

MYGGE emphasized the "Importance of Radiography in the Diagnosis of Aneurysm of the Aorta."

RASCH stated that twenty-five aneurysms of the aorta were discovered in the course of 3165 necropsies at Copenhagen. Syphilis was certain in 56 per cent., and probably in 82 per cent. He calls the aneurysm-forming process a chronic fibrous aortitis.

STORM BULL reported two cases in which he had based his diagnosis on the pulsation in the larynx, confirmed by the necropsy.

HANSSEN described certain accidental heart sounds, observ- that a whistling sound in pericarditis indicates synechia.

Professor MEDIN noted the increasing frequency of "Morbus Barlowi" in Stockholm, among children with syphilitic inheritance, rachitis, etc. He described fifteen observations, with four deaths. Three of his cases had no trace of rachitis. He found fresh lemon juice the most effective treatment.

HALLARGER commented on the comparative temperature in the rectum and axilla as an aid in the "Diagnosis of Hysteria." There is no difference between them, as in normal conditions, or it is reversed; sometimes the axillary temperature is the higher by two to three-tenths of a degree.

Professor GRAM endorsed peronin as a valuable acquisition, to take the place of morphin, using twice the dose. He has found it effective in sixty cases of neuralgia, nervous sleeplessness and tuberculous cough.

USTVEDT reported that Widal's sero-test failed in over 26 per cent. of the cases in a recent extensive epidemic of typhoid, while it had resulted positively in 100 per cent. during the previous epidemic.

Professor LAACHE closed the scientific communications with an address on "Paroxystic Tachycardia," which he considers a neurosis.

The Christiania physicians own a commodious building for their local gatherings, which was the envy of many visitors, and the excursions to the sanitaria, etc., in the neighborhood, aroused much enthusiasm for the beautiful scenery and general appointments. The Congress will meet at Copenhagen next year.

SELECTIONS.

The Rabietic Bacillus.—Foll, Rivolta and Spinelli claimed to have detected a bacillus the specific character of which was made highly probable by Sanfelice, who, employing a special staining process, demonstrated its presence in large numbers in the spinal cord of a boy who had died from hydrophobia. Memmo of Rome confirmed the observation of Sanfelice and proved the virulent character of the micro-organism, which he detected in several cases of rabies, but quite recently he has succeeded in cultivating it in artificial media, and in reproducing by inoculations with these cultures the disease with its distinctive characters, in dogs, rodents and birds respectively. These experiments and observations, which fulfilling the most stringent demands of bacteriologic criticism, leave no room for doubt, are described in the *Centralblatt für Bakteriologie*. He found the microbe in the cerebro-spinal fluid and the substance of the brain and spinal cord, in the saliva and parotid gland, and in the aqueous humor of four dogs dying from the natural disease, and of rabbits, guinea pigs and pigeons, in which it had been produced by inoculation. It grew better in fluid than in solid media, the best being bouillon with glucose slightly acidulated with tartaric acid. The growth did not become manifest under a week, and was easily arrested by "air infection," as through the access of dust from the laboratory. Inoculated with cultures of the fourth generation, purified by successive plate cultures, guinea-pigs and rabbits developed symptoms of paralysis of the hind limbs, etc., after from eleven to twenty days, and died from the paralytic form of the disease. With dogs the inoculation was prolonged to from thirty to sixty days, when they were attacked with all the symptoms of typic natural rabies. Though Memmo does not suggest the application of his discovery to the prophylaxis of hydrophobia it is not impossible that artificial cultures may be found capable of definite attenuation so as ultimately to simplify the methods adopted by Pasteur.—London *Lancet*, September 17.

Destruction of Locusts by Arsenic.—Physicians are so frequently consulted regarding crop pests, that we reproduce, in part, an account of the means found successful in Natal, South Africa, in combating the locust scourge. It is quoted from the *London Times*, Sept. 23, 1897: The mixture used is prepared by heating four gallons of water to boiling point and then adding one pound of caustic soda. As soon as this is dissolved, one pound of arsenic is added, after which the liquid is well stirred and boiled for a few minutes, care being taken that the fumes are not inhaled. Being poisonous, the mixture is kept under lock and key; but, when required for use, half a gallon of it is added to four gallons of hot or cold water, with ten pounds of brown sugar. A still better preparation is made by adding half a gallon of the poisonous liquid to five gallons of treacle. Maize stalks, grass, etc., dipped in the mixture, are placed along the roads and in the fields, and the material can also be splashed with a whitewash brush upon anything which the locusts are known to have a liking for. Attracted by the odor of the sugar or treacle over a distance of as much as 100 yards, the locusts will eat of the mixture and die. These are eaten by other locusts, and in a few days' time the ground may become strewn with the dead bodies of the insects. With ordinary care, no risk of poisoning any human being is incurred, while the small quantities of the material on a piece of grass or maize stalk is said to be insufficient to injure stock of any kind.

Fowls have been known to feed without injury on the arsenic-destroyed locust. The evidence adduced indicates that "hoppers," however numerous, can be destroyed in a few days, and the crops thus saved from their ravages. Should the winged locusts swoop down later in the season, the crops, in virtue of the vigor acquired from their early unchecked growth, will be in a far better condition to withstand attack. Arsenic is quite effective in destroying flying locust; but, as they come and go very suddenly, it is difficult to have the poison in readiness at the critical moment, and hence the most deadly blow can be dealt at the pest when it is in the hopper stage. One Natal cultivator cleared his farm, occupying 700 acres, of locusts in ten days by means of the arsenical mixture. As is well known, arsenic forms the basis of most of the sheep dips in common use, and it may be that the efficacy of arsenic as an insecticide in the fleece of the sheep will find a parallel in its application as a locust destroyer in the vast wheat fields of the Argentine and elsewhere.

PRACTICAL NOTES.

Radiography of Fetal Lungs.—Atelectasis is readily distinguished in a radiograph of a fetal lung, and can thus be demonstrated in court in doubtful cases.—*Gazz. d. Osp.*, September 4.

Potion for Whooping-Cough.—Koplik recommends the following in the dose of half a teaspoonful three times a day: Tincture of digitalis 1 gm.; antipyrin 2 gm.; elixir paregoric 4 gm.; syrup of tolu 60 gm.—*Semaine Méd.*, October 19.

Extraction of an Incarcerated Pessary.—With the Gigli saw, the accessible portion of the pessary is sawed off, and the pessary can then be revolved until the plane left by the excision is brought opposite the projection that opposes its exit, when it will easily slip out.—*Semaine Méd.*, October 19.

Carbolic Gangrene.—Ponzio claims that gangrene following the use of a phenicated solution is due to the compression of the bandage arresting the circulation. If a standard solution is used and non-compressing bandages ordered, neither the druggist nor the surgeon are responsible for the gangrene, which, if it occurs under these conditions, must be caused by some idiosyncrasy.—*Gazz. degli Osp.* September 11.

Potassium Permanganate in Lupus.—Kaczanowski has cured thirty-four cases by dusting the surface with 2 to 5 milligrams of potassium permanganate, after removing the crusts with vaselin and warm soapy water. One application proves sufficient; the scab falls in fifteen days and the patch heals. A nitrate of silver salve hastens the cicatrization. The application of the permanganate is painful, but bearable, and no worse than other caustic remedies.—*Semaine Méd.*, October 19.

Non-toxicity of Orthoform.—Two cases are reported in the *Munich Med. Woch.* of October 18; one an extensive cancer of the mamma and the other decubitus sores (morphinomaniac), in which orthoform was used every day for months to relieve the pain, with complete success and without the slightest symptom of intoxication. In the first case 4266 gm. were used in five months, and in the second 5600 gm. since last March, or 15 gm. a day.

Suprarenal Extract.—Von Cyon states, in a preliminary communication in regard to the physiologic significance of the effective substance in the suprarenals, that the extract has a highly stimulating effect on the sympathetic nervous system of the heart and the vessels (accelerants and vasomotors), while it has a paralyzing effect upon the regulator nerves of these organs, the vagus and depressor. Suprarenal extract is consequently a powerful antagonist to iodothyrin and the hypophysis.—*Deutsche Med. Woch.*, from *Pflügers Archiv für Phys.*, p. 370.

Dry Treatment of Pus Pockets.—Del Vecchio urges the abolition of the practice of washing out cavities with antiseptic or sterile fluids after evacuating pus. He claims it is directly injurious, and cites a large number of cases he has treated "dry," in which the cure was much more prompt than usual. Even in case of a fistula he merely wipes it dry with gauze and applies a compressing bandage, without drainage or irrigation, occasionally instilling a few drops of some modifying liquid through the mouth of the fistula, left open.—*Gazetta degli Osp.*, September 11.

Conservative Treatment of Wounded Hand.—The main point is to cleanse the hand thoroughly, best accomplished with alcohol and ether, followed with copious irrigation with a stream of hot water, at 50 to 55 degrees C., which has the threefold advantage of being hemostatic, aseptic and warming, thus counteracting the coldness that follows the traumatic shock. It may be necessary to use an anesthetic to make the cleansing as perfect as necessary. Once completed, the wound is dressed with iodoform, or simply sterile gauze, and left untouched for four days, with the hand and forearm immobilized. A wound thus treated heals without a trace of suppuration.—Martin: *Jour. des Pract.*, No. 30.

Strangulated Umbilical Hernia.—Dr. R. Fowler has been enabled to present before the Brooklyn Pathological Society a case of successful operation for the resection of a portion of the small intestine for the above-named condition. The history of the case is not unusual—the ordinary history of vomiting and acute onset, with hardly any rise in temperature, and the strangulated intestine was not situated through the umbilicus, but right along side, as is usual in these cases of acquired hernia. The Murphy button was used and came away on the ninth day. The case calls to mind an earlier one operated on by Dr. S. McGuire of Richmond, in October, 1895. It was a case of strangulated umbilical hernia of forty-eight hours standing, with fecal vomiting, etc. He removed fifteen inches of gangrenous ileum. The patient recovered, the Murphy button coming away on the twentieth day, and the button showed a ring of the intestine at the site where it was placed. In the discussion following the report, Dr. H. B. Delatour offered the following observations regarding the obstacles to recovery after strangulation of hernia of this type. He said: "I think the trouble in strangulated umbilical hernia is, first, that we have the strangulation occurring high up in the intestine, with early appearance of fecal vomiting; second, that we have umbilical hernia occurring most frequently in people who are immensely fat, and in addition to having fat in the abdomen they have fatty degeneration of the heart. Those two points I think enter very materially into the prognosis of the cases—the fecal vomiting occurring early; the retrostalsis pours fecal matter into the stomach when the patient is under the anesthetic, and vomiting occurs; the fecal matter gets into the pharynx, and very frequently portions are inhaled, and may set up either an acute edema of the lungs or be followed by septic pneumonia. I have seen that in a number of cases. In one case upon which it was my fortune to operate, the patient died about ten days or two weeks after operation from the heart conditions solely. The abdominal condition was perfect; the wound had healed by primary union, and the patient died simply from the weakened heart condition. I think the heart was influenced by the anesthetic, and it was the result of the action of the anesthetic on the fatty heart that caused death in that case. Three times before she finally died, within a week, at intervals of twenty four to forty-eight hours, she became absolutely blue from head to foot, and it did not seem possible she could ever recover from the condition, although she did. I have forgotten just what attack she died in, but it was after she had had several. I have operated on quite a number of cases of strangulated umbilical hernia and I recall only one case that permanently recovered.—*Brooklyn Medical Journal*, October.

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SATURDAY, NOVEMBER 19, 1898.

CHRISTIAN SCIENCE AND THE LAW.

"Christian science," which may have been prophetically referred to by St. Paul when he wrote to Timothy about "science falsely so called," has apparently made itself amenable to the criminal law in England by the proceedings that preceded and it would seem safe to say directly caused or insured the death of an eminent litterateur. The sacrifice of one valuable life has at last called the attention of the public to the delusions which might perhaps have worked disaster to many more obscure individuals without such effect.

It seems strange that a man of culture, of such penetrative judgment, as some of his writings would imply, as HAROLD FREDERIC should have been a willing victim to what ought to seem to any practically minded man a very transparent delusion. While the fact is hard to account for, assuming him to have been in mental health, something may be allowed for the common and, as it were, very natural affection of the judgment in even any form of bodily disorder. We are all of us apt to be hardly our normal selves under the influence of sickness, and even an educated and thoroughly well-balanced physician, to assume an extreme case, might, under certain circumstances and with certain surroundings, allow himself to be treated by altogether unorthodox and unscientific methods. There is, moreover, a remnant of superstition in all of us, and irrational prejudices and beliefs crop out in the most unexpected quarters. As a scientific investigator who has been amongst the foremost in discussing and developing some of the most important biologic questions, Mr. A. R. WALLACE ought, it would seem, to be qualified to express a correct opinion on sanitary subjects, but we find him raving against vaccination, a preventive measure that has stood the test of one hundred years since JENNER'S announcement of his discovery, and which has rendered comparatively harmless one of the greatest scourges of our race. With such examples as this, one need not be surprised at any vagaries on the part of the public or of less prominent individuals.

So far as known, there has not been a conviction for manslaughter of a Christian scientist in this country, though occasions for such an event have certainly not been wanting. In so far as the devotees of this delusion actively interfere to prevent the necessary remedial measures and the patient dies in consequence of this, it is hard to see how, with any reasonable interpretation of the law, they can escape its penalties. They certainly in some cases, like that of Mr. FREDERIC, prevented what might and probably would have saved life. The case may be different as regards the standing of Christian science where life is not involved, and we do not see the correctness of the conclusion in a recent editorial in the New York *Sun*, that, because a court held that contracts for such treatment are valid, the same court would necessarily hold that a charge of neglect and of manslaughter would not lie if death occurred under the care of a Christian scientist who, it could be proven, excluded rational measures that presumably would have saved life. The civil and the criminal sides of the question may differ to some extent, but where the charge of criminal negligence or worse is raised, it would necessarily have to be seriously considered by any court, and it is not easy to see how well-proven evidence of this character could be managed so as to evade the penalty of the law. Judges and juries are fallible, however; some of them may be ardent advocates of Christian science, and it is difficult to say how these facts may distort judicial views and verdicts in special cases.

It will be interesting to follow the proceedings in the FREDERIC case and to see how British justice deals with the matter; the prominence of the victim and the special issues involved will tend to make it a *cause célèbre*. If conviction follows, the status of the delusion in English jurisdiction will be materially affected and it would seem improbable that it could derive any benefit under the plea of persecution if the facts were fairly published and understood. The results of a similar prosecution which has just been instituted in Cincinnati will also be followed with interest by the medical profession and the public generally.

THE CARIBBEAN CLIMATE IN ITS MEDICO-HYGIENIC RELATIONS.

Where so much good, bad, and indifferent has been written about the medical conduct of our late war, it is to be regretted that so little trustworthy informa-

tion is to be found in a short, codified form regarding the climate of the West Indies and the nature of diseases peculiar to Army life.

Excepting the work of LAVERAN on Army diseases and the condensed but comprehensive articles in "Reference Hand-Book of the Medical Sciences," by Dr. IRVING C. ROSSE, on this subject and on the medical topography of the West Indies, but little appears to be written. Even this little, known to comparatively few readers, would not be referred to here but for the present and prospective interest among our people—civil and military—in all that pertains to the Caribbean climate. Outside of the armed forces, the principal element to be affected by the climatic influences of the Antilles are the large number of business men either permanently or temporarily sojourning in our new possessions; the tourist in search of winter sunbeams, and the invalid suffering from pulmonary or other chronic disease.

The physical surroundings of war are anything but conducive to seeing with judicial clearness, and such adynamic concomitants as a diet of salt pork amid stifling heat, diluvial rain, and malaria are assuredly not calculated to give a soldier that rosy view of the radiant skies of immaculate serenity, the flamboyant vegetation, and tropic loveliness of islands that seem lotus-bearing and Eden-like to the well fed and comfortably placed voyager on sudden arrival from the March winds of our bleak New England coast.

The West Indies, usually associated in our minds with rum, molasses, yellow fever, hurricanes, negroes, and general economic, moral and political relaxation are reported to be, and in fact are, very unhealthy, although the islands differ greatly in this respect, the general mortality being influenced by season and altitude, and by the fact of the decedents being indigenes or strangers. The Caribbean summer is a season always attended by mortal maladies to man, beasts, and plants, and by disorder of the elements, which are upset in a frightful manner. With the advent of the hurricane season thunder groans from one end of the horizon to the other, with seismic convulsions, tidal waves, and pathologic phenomena, chief of which is yellow fever. In addition the gravest epidemics of the tropics manifest themselves in the form of malarial fevers, dysentery, and hepatic diseases, which prevail at all the islands at all seasons, and are common to all races. But a compensating factor is the salubrity of the mountain regions—more particularly that of the volcanic mountains. What is known as a climate of impression may be found at a small height. Above 1000 feet yellow fever scarcely ever occurs, the lower sugar-cane lands being its natural abode. At about 2000 feet cooler temperature with more marked delimination of the seasons is found, along with thermometric and barometric variations of such absolute regularity as to attract attention. A very small number of nycthermal observations suffices to show the regularity of these movements in an atmosphere free from ochlitic or zymotic contamination.

The mountainous and highly picturesque aspect of the volcanic Antilles, with their blue pyramidal outlines on the horizon, and conical peaks losing thin summits to the clouds, owes this physical configuration to the fact of the islands being nothing more nor less than vast mountains resting on the ocean bed. Bathymetric observations show the deepest water of the Atlantic in their vicinity, being about 5.6 statute miles at "Bronson's Hole," a little north of Porto Rico.

To give systematically the medical topography of most of the islands, particularly those of volcanic formation, would be to repeat many details already familiar to newspaper readers. The characteristics of an active *soufrière*; numerous hot springs; an indescribable richness and variety of bird, insect, and fish life, beautiful scenery; magical and marvelous sunset effects; lovely climate at certain seasons, and botanical remarkableness are so common and striking as to have led DARWIN to speak of Jamaica as "a great, wild, untidy, luxurious hothouse."

The principal climatic observations being likewise more or less matters of common knowledge, it suffices to say that meteorologically there is nothing excessive in the character of the Caribbean climate, which, instead of our four seasons, consists of but two, known to climatologists as *diorique*. Rains, during the season of stifling heat, are the peculiarity of the West Indian region. It is, in fact, the combination of humidity with long-continued heat, rather than its intensity, that marks the climate of the Antilles and causes its insalubrity. Not only does this combination corrupt all kinds of food with great rapidity but hatches out myriads of insects of all species to such an extent as to become repugnant and destructive. Besides, the climate relaxes and impairs the fibers in men and animals, renders them lazy, inert, and phlegmatic, and reduces them promptly to a state of complete atony. In these islands of indolence even mosquitoes are lazy and appear supremely indifferent; fish are not game; imported quadrupeds weaken and degenerate rapidly, the hog alone flourishing. The African negro, transplanted to a sky but little different from his own, has scarcely any physical or moral modification. Flourishing in the Antilles like the green bay-tree, nature is there so much in his favor that after successive generations of mulattoes, children revert to the negro type. More than one-half of the entire population of the West Indies (4,000,000) are negroes, the remainder chiefly mulattoes. Frenchmen do not acclimate and flourish here as they do in Canada under the same isotherm as Denmark, and it is an undisputed fact that families who are not recruited from time to time become extinct in the third or fourth generation. And so we may ascend the zoölogical scale to the Anglo-Saxon, who does not

flourish in an *diorique* climate made tolerable only by the influence of trade winds. Many of our people have seen repeated object-lessons of this fact in the weazen-faced cachectic soldiers who, aside from other unmentionable privations, the criticism of which is outside our province, owe their lowered vitality mainly to such atmospheric vicissitudes as the mid-day sun, the chill of night, and the morning dew of the Caribbean climate.

The question of the disorganizing effect of this climate is therefore one of a highly practical nature, which at present greatly concerns not only our soldiers obliged to serve in the Antilles, but others who may visit them for business and pleasure.

As a matter of fact the subjective bodily effects of the climate are more agreeable than is imagined by persons who have never visited the Antilles. It is well borne by strangers during a temporary winter sojourn; the danger and annoyance therefrom may be much diminished by hygienic measures, and there are healthy and attractive spots where invalids may obtain the advantages that the climate affords.

Notwithstanding the great mortality among our soldiers in the West Indies, it is a notorious fact that much of it was unnecessary and might have been avoided by proper attention to sanitary measures. British regiments have had sad experience in this part of the world, the Twenty-ninth Foot being almost annihilated in Barbadoes by mortal disease in the early part of the present century. However, during a recent service of three years, it is said that none has ever served the same time in the West Indies with so little fatality. The extraordinary good health of the battalion of U. S. Marines lately returned from Guantanamo without the loss of a man from disease, is another striking example of what may be done by proper hygiene.

Doubtless the surgeons of our Army will learn and practice the hygiene of hot climates when they have become emancipated from the thraldom of circumlocution and red-tape, and the narrow ideas engendered by long service at small army posts.

The death-rate of armies has decreased within the last few years, and the general health has greatly improved, but this improvement did not originate with the medical officers. It was brought about by outside influence. In most armies we find the average medical officer about as apathetic and unprogressive as the line officer, who in former days made strenuous objections to the innovation of fire-arms for bows and arrows, and still later, even up to the time of General Scott, to the introduction of the percussion-cap in the place of the old flint-lock, and the substitution of breech-loaders for smooth-bores and muzzle-loaders. In saying this it is far from our intention to arraign or criticise a body among whom are many honorable exceptions—men who have advocated the principles upon which sanitary ameliorations are founded. But it is a matter of history that sanitary reform in the army has been brought about by outside influence. Just as advance in psychiatry, neurology and improved treatment of the insane since the days of Pinel have come from persons unconnected with insane asylums, so have the acts of citizen organizations been of the greatest benefit in removing existing evils and suggesting remedies. This is no less true than the fact that it is impossible to point to any great medical or surgical discovery made by persons connected with armies.

The British army owes its redemption from special sickness and undue mortality to Lord Herbert, Lord Gray and Florence Nightingale, who did so much to relieve the sick and wounded in the Crimea. The sanitary commission of the Civil War contributed much to the comfort of the well and the relief of the wounded; and many poor, fever-stricken patients, whose presence was a scourge and an encumbrance to the Army during our late war, will remember with lasting gratitude the humanizing efforts of the Red Cross.

In spite of the introduction of many reforms and the decreased death-rate of armies, as shown by statistics of the last few years, comparison places army mortality and loss from sickness at a figure still in excess of that of the civil population of the same age living under analogous conditions. Since it would be manifestly out of place to discuss at this present the causes that brought about a mortality of 66.6 per cent. from disease in our Civil War, and the enormous percentage of 88.1 in the Spanish War, it may suffice to say that the diseases influencing the operations of war are mainly those of civil life modified by mesologic circumstances, as typified by the accidents arising from atmospheric or telluric influences, the manner of life and the food consumed. The prevailing diseases of the West Indies, whether among soldiers or civilians, are mostly acute, and at least two-thirds of them being zymotic, are consequently preventable by hygienic or other conditions.

To describe the peculiarity of these diseases and their mode of action would require a repetition of what may be better found elsewhere in works devoted to the maladies of hot climates. It is rather their prevention that most concerns the intending voyager, whether soldier, merchant, or invalid; and in the existing conditions, owing to the absence of sanitary police, it follows that on visiting the Antilles a certain amount of care and circumspection are imperative. The Carribbean climate, at its best, from November to May, is well borne by strangers; and despite the drawbacks of warm latitudes and bad sanitation, one may find Englishmen and other Europeans who have lived many years in the West Indies without sickness. From such old residents many hints of useful nature may be had, which go to corroborate one of the clearly demonstrated facts of preventive medicine, namely,

that with properly enforced hygiene, both public and personal, whether among soldiers or civilians, sickness and mortality in the Caribbean climate may be not only minimized, but reduced to almost that of more favored spots.

THE RELATION OF DISEASE OF THE ACCESSORY CAVITIES TO OPHTHALMOLOGY.

The general practitioner, no less than the specialist, is often puzzled as to the exact cause or causes underlying headaches and neuralgias. While the one is inclined to refer them to the gastro-intestinal or genital tract, the other hastens to ascribe them to alterations from the normal of the various organs that come under his care. Only when both have tried their skill and after apparently righting all existing difficulties in either direction with no relief forthcoming, is there, as a rule, any attention paid to those prolific factors in the etiology of intense cranial pain, disease of the frontal, maxillary, ethmoidol or sphenoidal sinuses. Even the splendid monograph of ZUCKERKINDL on "The Normal and Pathological Anatomy of the Nasal Cavity and its Pneumatic Accessories" directed little attention to these important structures aside from the interest of his immediate followers. In these later times, when the eye surgeon pure and simple is practically an unknown quantity, and the former specialist in eye affections now devotes additional attention to the ear, nose and throat, the surgery of the accessory sinuses falls into the latter's hands as a matter of course.

The cellular spaces contained in the temporal bones have long been recognized as common areas of disease usually secondary to trouble of the middle ear; sometimes the condition is acute, when symptoms of the greatest intensity and danger rapidly develop; more often the process is of slow development, and accompanied by caries of the temporal bone; in both instances a most characteristic symptomatology has been elaborated. In either case operative interference of the most radical kind is indicated and is usually followed by the most brilliant results. The next of the pneumatic sinuses to receive attention was the maxillary, and the scientific work done in this field must ever remain a lasting monument to dental surgery. Of late the remaining accessory cavities, the frontal sphenoid and ethmoid cells, are receiving a prominent place in head surgery. SATTLER (*Medical News*, Sept. 10, 1898) in this connection makes the following interesting statement: "The lesions of the pneumatic spaces of the frontal, ethmoidal and sphenoidal bones are disclosed by the almost uniform presence of characteristic symptoms on the part of the walls of the orbit, its margins or contents, and even if these uncommon cases have not attracted more general attention they, nevertheless, belong to the province of ophthalmic surgery. Unfortunately these cases have not received, even from the majority of ophthalmic surgeons, the attention they deserve, and only in those unmistakable examples of disease in which these sinuses become the retention-cavities of pus, larvæ, micro-organisms, or tumors, were the indications for rational surgery looked upon as imperative, and even in such cases, unnecessary delay was oftentimes resorted to." It will be noted that "characteristic symptoms" are referred to "on the part of the orbit, its margins or contents;" that is to say, we may have as the result of extension of disease and destructive pressure of contained products, lesions appearing at a distance from the original site of the disease. Under such lesions SATTLER mentions periorbitis and caries of the orbital margin, both following sinus disease. Displacement of the eyeball to either side or forward, producing pronounced exophthalmos, is a not uncommon symptom. As a result of periorbitis or caries we may have fistulous tracts formed which empty themselves, usually externally, far from the diseased origin. "With less frequency we meet with chronic empyema, hyperostosis, exostosis, periostosis, and the growth of osteophytes and exostoses; rarefaction of the cavities with dilatation, in exceptional cases, to enormous proportions; contraction of these spaces either confined to one or several, or as observed in these rare cases, of leontiasis ossea affecting all alike." Surgical treatment dealing with the apparent disease frequently relieves the symptoms but does not cure. It is only by getting at the primary foci and thoroughly eradicating them that we can hope for a permanent beneficial result. It might also be mentioned that it would be wise in the treatment of supra- and infra-orbital neuralgias before resecting the respective nerves to explore with great care the accessory cavities, for these neuralgic affections are not at all uncommon complications of the pathologic process under consideration.

What is the nature of the disease involving these sinuses? In the beginning doubtless streptococcus infection in many cases, either by the blood or more often from extension of nasal diseases, or in the maxillary sinus carious teeth. The pneumococcus is also present at times. In the chronic cases, where caries is a prominent symptom, cases without great pain and in which very little purulent material is formed, are frequently tuberculous from the outset; though indeed acute cases may be accompanied by caries and necrosis as the result of closure of all avenues of exit and a resulting harmful pressure.

Not infrequently we find no signs localizing the disease to any particular cavity, the only symptom indeed being intractable headache usually located in the frontal region, but may be radiating. In such patients the frontal sinus may be the one at fault; on opening the sinus everything at first glance appears normal, and it may be only by the careful use of the probe or curette that granulation tissue of uncovered bone is detected. That this apparent trivial condi-

tion has produced the symptoms is evidenced by the fact that drain of the cavity is followed by a disappearance of the terrible pain. Nor can these people be said to have been afflicted with hysteria and that any operation would have cured them: the large majority were by no means strangers to the operating table. SATTLER, by his timely article, written as it is by one of vast experience, can not but direct even more attention to this line of work than it is now receiving, and that is not inconsiderable. With the progress made of late doubtless the subject will received deserved notice, which is sure to bring about a rational and scientific treatment.

THE LIMITATION OF OPERATIVE TREATMENT OF EPILEPSY.

In the discussion of the operative procedure of epilepsy, one very important fact has failed to command the attention it deserves. Because an epileptic seizure is localized in its onset and course, it by no means argues that the epileptic lesion is a gross one or one to be benefited by operative procedure. We may have non-traumatic partial epilepsy, or what has been described by FERE as parcellar epilepsy or monospasm. These partial epilepsies may, and generally do, tally with grand mal fits in all other respects aside from their peculiar muscular spasm.

Again, because the epileptic fit has a leisurely and well-marked order of invasion in the convulsion, it does not necessarily prove that a focal disease is at the beginning of the fit. Many grand mal epileptics, apparently idiopathics, come to autopsy with no visible local cause for this systematic order of invasion. Even various forms of localized paralytic phenomena, motor and sensory, may occur in such cases without discoverable lesion in the brain. Facts like these should deter operative procedure in such cases. Further tests are necessary before we trephine them, as only harm can come from meddling in an operative way with such an epileptic's brain.

What, then, does the order of invasion prove to us? Simply that one part of the cortex requires less irritation to provoke a discharge, or has less power of internal resistance in maintaining its normal status, and takes the lead in the epileptic fit. Frequently we see one of these seizures delayed by mechanical means, until another part, usually secondarily involved, begins the muscular spasm. We are inclined to think a much narrower limitation of operative work among epileptics would result if the above facts were borne in mind.

The hereditary instability of the cerebral cortex of epileptics has not been given the attention of late years that it really demands. We can not refrain from placing ourselves on record as opposed to the radicalism in the present-day studies of the etiology of epilepsy. Some of the studies devoted to eye-strain and its correction, satirically referred to by one of our prominent neurologists as "tampering with eye muscles," is too absurd to call for special comment. GOWERS, one of the greatest living English authorities in nervous diseases, has said that the so-called reflex epilepsies are exceedingly rare.

To this same category may be assigned similar reflex disturbances in nasopharyngeal, urethral and many gastro-intestinal cases. In regard to this latter class of cases, which have probably given more aid to the upbuilding of the toxic, autotoxic and dynamic causes of epilepsy than any other phenomena in the disease, we notice that CLARK of the Craig colony, in his studies of the aura of epilepsy, has recently called our attention anew to the important fact that such symptoms from the digestive tract are most frequently due to a nerve disturbance originating primarily in the brain, and like any other aura or warning, referred to the periphery along sensory paths. Frequently such sensations may precede, follow or take the place of an attack. In this latter instance it exists as an aborted attack of epilepsy, common to the experience of many epileptologists.

Again, malassimilation, constipation and chronic intestinal catarrh may equally be caused by defective tone of the cerebral nervous system. We do not doubt that visceral symptoms most frequently accompany epilepsy as an effect of the disease and not as the cause. In such cases we should not consider toxicities as the one great thing to be studied and possibly eliminated, but the hereditary instability of the cerebral cortex of the epileptic. In our minute examination of the organism of the epileptic by the aid of chemistry and pathology, we are liable to overlook the autonomy of the nervous system as a whole. How often does the clinical observer declare on paper, in examination of a case of epilepsy, that there is "no cause in hereditary factors," and yet in looking at the case in a critical manner is able to see little indefinable and intangible frayed ends of inherited factors which come under the cognomen of no well-marked condition or disease.

At best, the study of the excitant of an epileptic attack will give us the degree of instability only and can not help to solve the far greater problem as to what that instability really consists of. The real chemico-psychologic change in the nerve-cell during an epileptic fit may never be known; at least by methods at present in use it seems impossible. As we have before remarked editorially in these columns, the necessity of approaching the pathologic physiology of epilepsy by means at present in use for the study of the brain in experimental psychologic laboratories can not be too urgently insisted upon. But it must not be studied in a psychologic light alone. Although we have received a rebuke from the great VIRCHOW in referring to a man as a "biologic unit," yet we can refer to it in this manner when we wish to express that the whole organism is to be studied,

and not a single apparatus. We must endeavor to bring to our aid in epileptic studies the accumulating facts of cytology in development and inheritance to further the study of the multitde of "biologic units" in man, and especially upon the units of the cerebral cortex.

INTERNATIONAL MEDICAL STATISTICS.

In 1894 an international committee of military medical men of which Dr. JOHN S. BILLINGS, then lieutenant-colonel and deputy surgeon-general on the active list of our army, was chairman, met at Buda-Pesth, Hungary, and formulated a series of international statistical tables with the view of enabling a ready comparison of the prevalence and fatality of disease in the various armies to be made. These tables were formally adopted, and since 1895 Surgeon-General STERNBERG has embodied them in his annual reports. Chiefs of the medical departments of other countries have not been so prompt in getting up their statistics in this comparable form. In the JOURNAL of May 21, 1898, we noted the publication of the first tables of this kind issued by the British Government, for the year 1896. We have now to record the publication of similar tables from the Netherlands for the year 1897 in the form of an octavo pamphlet from the *Imprimerie Nationale* at La Haye.

A few items taken from these tables will show the facility with which points of interest requiring investigation or explanation may be detected. The bracketed figures given below are those of our own army for 1897, obtained from the office of the surgeon-general. The recklessness of the United States soldier is manifested by the excessive number of accidental and violent deaths, as well as by the ruptures and the cases of alcoholism.

The mean strength of the Army of the Netherlands was 27,458 [23,843] during the year, and the admissions to sick report 1450.7 [1186.6] for every thousand men present. A total of 85 [86] deaths occurred among these, or 3.09 [3.14] per thousand living; but these deaths do not include 8 [10] suicides nor 6 [54] deaths by accident or violence. The amount of sickness was equivalent to 10.8 [13.1] days for each man in the army, and the average duration of each case was 13.9 [11.07] days. Arranged by months, September had the lowest admission rate, 73.6 [December 90.57]; March the highest, 177.2 [October 106.87]; August the lowest death-rate, .07 [July 0]; May the highest, .42 [June .46]. Of special maladies and groups of maladies skin diseases occasioned the largest number of admissions to sick report, 87.8 [75.37] per thousand men for the year, the cases having an average duration of 9.1 [8.3] days. Acute bronchitis came second with 52.7 [58.55] per thousand. The malarial fever rate was only 8.9 [80.69], notwithstanding the malarial reputation of the "Low Countries," sustained historically by the breakdown of the Walcheren Expedition. Forty-six [80] ruptures were reported during the year, the patients in 28 [65] cases having been cured and returned to duty. No case of acute alcoholism nor of delirium tremens [666 cases, or 27.93 per thousand men, with 2 deaths] was reported during the year; but there were 29.3 [55.49] admissions per thousand for gonorrhea, with an average duration of 32.7 [22.19] days, and 6.7 [12.79] for syphilis with an average duration of 34.5 [36.7] days. Only 16 [174] cases of typhoid fever were reported, but of this small number 7 [8] were fatal; 193 [65] cases of pneumonia of which 14 [4] ended fatally and 122 [59] cases of consumption, 16 [7] fatal. The advantages of these International Tables are obvious.

CORRESPONDENCE.

The Vital Statistics of the War.

WASHINGTON, D. C., Nov. 12, 1898.

To the Editor:—In a communication in the JOURNAL of October 29 I directed attention to the unsubstantial basis on which an editorial writer in the *Philadelphia Medical Journal* made a demand, on behalf of the medical profession, for an explanation of the fact that the ratio of death from disease to death from all causes was greater in the Spanish War than in the Civil War. The pressure of official business was so heavy that I was unable to discuss the conclusion admissible from the figures given by the journal cited, or to give some statistics which I am confident would have been regarded with interest by the members of the AMERICAN MEDICAL ASSOCIATION, but this I propose now to do.

The statement was made that death from disease formed 66.6 per cent. of the total mortality in the War of the Rebellion and 88.1 per cent. in the Spanish War. Accepting these figures at their face value, for I have not considered it worth while to verify them, we learn simply that more men were killed and fatally wounded out of every hundred who died in the service of their country a third of a century ago than in the recent war. This we can readily understand, when we recall the fact that on July 21, 1861, when the first serious clash of arms took place between the North and South at Bull Run, Va., nearly as many men were wounded and nearly twice as many killed as in the whole Spanish-American War. This one fight was but the beginning of a series which ran the list of battle fatalities up to the terrible total of more than ninety thousand deaths. It may, however, be claimed that the difference between the ratios in question was due, not to a greater prevalence of battle casualties in the former war, but to a greater prevalence of fatal disease in the late war. This can not so readily be accepted as an explanation, although a great deal has been said, written and printed about the sickness at Santiago, Chickamauga, Alger and other camps where our volunteer troops were aggregated. We may not assume that the sickness which affected our young men was more extensively disseminated or more deadly than that from which their fathers suffered in the earlier war, because, as a matter of fact, we know that it was not so. Time has dulled the National memory of what happened in the days of the Civil War. Perhaps the remembrance of those times remains fresher with myself than with most others, not because I was with the troops in the field until the end came at Appomatox, for many others had as full an experience of army life in the field, but because it afterward became my duty and my high privilege to spend over three years of my life in studying the records of sickness, while compiling the third part of the medical volume of

the "Medical and Surgical History of the War." That history is on our shelves, and by referring to it we may at any time find out how diarrhea and dysentery, typhoid fever and malarial diseases swept through our camps and sent their thousands to the hospitals and to their graves. We may also compare the deaths recorded by the medical officers of those days with the deaths recorded by the medical officers of the present time, and should we do so we would find overwhelming testimony to the effect that any differences discovered in the percentage of deaths from battle, casualties, and from disease, are not due to the greater prevalence and fatalities of disease in the recent struggle, but to the number of sanguinary battlefields of the Civil War.

In April, 1861, President Lincoln called for 75,000 volunteers, but it was not until after July 22, when his call for 500,000 was made, that we had armies comparable in size with those recently in existence. Beginning, then, with July, 1861, when we had medical reports from regiments aggregating only 69,118 men, and including August, September, October and November, five months, we find recorded a loss by death of 3075 men in the reports sent in by medical officers, from an average strength present of 177,690 men, or 17.31 deaths out of every thousand men during that period of five months. More deaths occurred than were reported, for some surgeons failed to send in reports; but the probabilities are that, had the missing reports been forthcoming, the deaths would have continued to have the same proportion to the reported strength.

In April, 1898, President McKinley called for 125,000 men and later for 75,000, which, with an increase in the regular Army and the immune and other special regiments, made a total of over 270,000 men. Beginning with May, 1898, for which month we have medical reports in the office of the Surgeon-General of the Army from regiments aggregating 151,685 men, and including June, July, August and September, five months, we find on file a loss by death of only 1715 men reported by medical officers, in an average strength of 167,168 men, or 10.21 deaths out of every thousand men during that period of five months. More deaths occurred than were reported, for some surgeons have failed so far to send in reports, but the probabilities are that were the missing reports forthcoming, the additional deaths would be associated with a proportionate increase of the strength. This proportion of deaths to a strength of 270,000 men would give 27.70 as the total of reported and unreported deaths.

According, then, to the testimony of every medical officer who has placed himself on record then and now, we lost in the five months of the war with Spain 10.21 men out of every thousand reported present by medical officers serving with them, and in the first five months of the War of the Rebellion, 17.31 out of every thousand similarly reported present. This is interesting, but it is still more so, if we look a little more into the details of these reports. During the month of May last the death-rate was low, .46; it was somewhat higher in June, .70, or the equivalent of an annual rate of 8.4 per thousand. In July it rose to 2.15 for the month or the equivalent of an annual rate of 25.8 per thousand. In August, owing to the rapid spread of typhoid fever in the camps, and to the broken down condition of General Shafter's Corps, it reached 4.08, equal to an annual rate of 48.96, such as was common in cities before the era of municipal sanitation. The War Department immediately put forth its energies to remedy this condition of affairs and with such efficacy that the death-rate in September fell to 2.45. If it be claimed that this falling off was due to the fact that the typhoid infection had done its worst and that, irrespective of all sanitary measures, the death-rate would have fallen owing to the exhaustion of susceptible material, we have merely to consider what was the history of our Civil War camps subsequent to November, 1861, when, as I have stated, the number of deaths had already amounted to 17.31 per thousand of the strength present. In that month of November the rate was 4.27, or somewhat more than our recent maximum of August last; but the next month, December, showed no sign of decrease, for 1578 men died, or 4.69 per thousand. During January, 1862, the ravages of disease continued, 1664 men having been swept away by death, or 4.84 out of every thousand of those present. In February the rate was 4.79 and in March 6.08. In April the culmination was reached when 3331 deaths were reported, constituting a death-rate for the month of 8.42 per thousand, a rate twice as high as that reported from our camps in August last.

This is a startling record. Mortality from disease reached its maximum in the camps of our Civil War only at the end of ten months, if we count from July, 1861, or at the end of twelve months, if we count from May, 1861, when 47.56 men had been buried out of every thousand of strength present, or, to put it otherwise, the maximum monthly mortality was reached only after ten or twelve months of suffering, during six of which the mortality was greater than that of the disease which did so much harm in August last. In that month the country became excited over the hysteric utterances of yellow journalism, with 4.08 deaths per thousand, and the *morale* of the Army became broken by making the volunteer believe that never in the history of armies had men suffered from disease as he and his companions had suffered. Yet thirty-seven years ago the flower of the manhood of this country, after months of deadly losses, suffered in April, 1862, more than twice the loss incurred in August last, and instead of going home on sick furlough they girded up their loins for the attack on Richmond, by way of the Peninsula.

Respectfully, CHARLES SMART,
Deputy Surgeon-General, U. S. A.

Bicycling.

SEATTLE, WASH., Nov. 5, 1898.

To the Editor:—In the JOURNAL of October 29, you have something to say about the ill effects of bicycle riding, and among other things is mentioned the long-since prophesied ill effects on the female pelvis, by way of distorting or contracting the same, and rendering childbirth more difficult. A little further on you say: "We are not aware that the obstetricians are having any greater difficulty in delivery than formerly." And why should they? The gentleman who had prophesied that the bicycle would have a serious effect on childbirth had a mistaken idea of the entire proposition. While bicycle riding may deform the pelvis, it will have little or no effect as regards the ease of childbirth. And why? For the simple reason that "bike" riders do not have babies. Where or who is the physician that has attended a "bike" rider in confinement? Will the female rider throw aside her wheel long enough to have a baby, let alone to rear a respectable sized family? The bicycle is a nuisance and a curse instead of a blessing. While it may have a beneficial effect physically upon a few, yet the ill effects upon the many ten thousand times overbalance it. The deaths and the maiming from wheel accidents almost equal perpetual war. The injury to heart and kidneys of thousands must be added. Then what of the nuisance of the machines on street and sidewalk everywhere? In the public thoroughfare they are a constant menace to teams and footmen, and as there is no bounds to the impudence and effrontery of these wobblers, they presume also to usurp the sidewalks in most cities, whether permitted or not by law? Think of such ungovernable vehicles approaching foot-people on sidewalks every few rods as they proceed, at a speed of twelve to fifteen miles an hour, jingling their little bells, warning you to jump aside or be run over or maimed! And when one steps aside there is no telling but the cranky thing will make a dive for his solar plexus or coccyx, since all sorts of wobblers presume to usurp the walks that were in

times past, before we became so civilized, supposed to be for footmen only.

The advent of this horrid means of locomotion is an instance in which the inventive genius of man has overtopped itself, or at least he has invented a machine that causes a great many individuals to be overtoppled. Here in Seattle, bicycle riders pay a license and are permitted by law to ride on the sidewalks, so footmen step aside as they whiz by or take the chances of suddenly converting the momentum of one of these machines and its rider into heat, light and electricity.

A. C. SIMONTON, M.D.

Conservative Treatment of Intestinal Occlusion by Internal Electricity.

OAK PARK, ILL., Nov. 15, 1898.

To the Editor:—A criticism of an article under the above caption, credited to the able pen of Dr. J. R. Pennington of Chicago, appears in the JOURNAL of November 5. As the author of said article I respectfully request that you publish my answer in your columns.

1. The critic calls me to account for not giving Dr. Boudet credit for his original work and untiring effort. However, I did state in quotation from Dr. Larat that Boudet had treated fifty cases with 75 per cent. of cures, a better percentage of cures than is shown by any other practitioner, even including surgery.

2. As to electrolysis: He says to use the author's electrode, the oxychlorid of the metal used may have an indescribable effect on the tissues, and attempts to overcome this difficulty by using a disc of soluble "copper, carbon, zinc, gold or platinum." Of course he does not mean a solid disc of gold or platinum. The expense is prohibitive. Consequently I fail to see his advantage over me, as it is as easy to plate my electrode as it is his disc. His deductions on electrolysis, however, are overdrawn. With the current used in this treatment it would be so slight as to be harmless, unless the treatment was carried on indefinitely.

3. The Doctor criticises me, in very poor taste, on the "Code," for in the same breath he describes minutely, with an accompanying cut, an instrument that is named "Dr. J. R. Pennington's Colon Electrode." As to the merits of his instrument I am doubtful. The coil (which he is pleased to call a flexible cable), covered with vulcanized India rubber, is no better as a conductor than an ordinary copper wire, and of no more use as a mechanical device for introducing the rectal tube. This deduction is from the fact that the coil is smaller than the internal diameter of the soft-rubber colon tube, and does not support the caliber. Consequently, the tube will kink and double up, and is no better than the soft-rubber rectal tube, and can not generally be introduced into the sigmoid flexure. As to the general similarity of the two rectal tubes under discussion (his and mine), I will simply refer you to the cut in his article, and the description of my tube which I give in my original article. From this comparison the reader may draw some very interesting conclusions as to Dr. Pennington's general source of information on the subject.

R. P. JOHNSON, M.D.

Rush Monument.

PHILADELPHIA, Nov. 4, 1898.

To the Editor:—As the committee on Rush monument are desirous of having a thorough organization of the profession in the States and Territories, will you please urge immediate attention to the request for the appointment of a committeeman for each State and Territory? Thus far very few have notified me of any selection of a representative.

Yours very truly,

W. B. ATKINSON, M.D.

Foreign Body in the Ear.

CINCINNATI, OHIO, Nov. 6, 1898.

To the Editor:—Mrs. H. brought her son, 9 years of age, to consult me in regard to his left ear. He had been treated for earache, deafness and ringing in the ear by a physician for the past month, but could not get any relief. Good illumination showed the auditory canal to be normal, but what at first sight I supposed to be the membrana tympanum, showing as it did the cone, or pyramid of light, did not present the outlines of the ossicles. Instead of probing I used the politzer inflation on that side, and again examined the ear and found that I had dislodged the supposed drum, which was a foreign body tightly impacted against the membrana tympanum. A syringe full of warm sterilized water brought away a circular concavo convex piece of mother of pearl (the larger end of a small button). When in the ear it presented the concave surface.

CUNDELL JULER, M.D.

PUBLIC HEALTH.

Hay Fever in Switzerland.—A collective investigation of the etiology and therapeutics of hay fever has been commenced in Switzerland by Dr. A. Wyss of Geneva, according to the *Schweiz. Corr. bl.*, No. 19.

Hygiene in Schools.—The recent French Congress for the Advancement of Science passed resolutions urging the teaching of hygiene by a physician in all the schools above the primary grades.

Sanatoria for Convalescents.—The city of Paris has recently entered into possession of a much-needed asylum for convalescents, a chateau at Mary-sur-Marne, which, with its large grounds, was bequeathed by its late proprietor for the use of women who have undergone surgical operations in the Paris Hospitals. There is already room for forty.

Quarantine Convention Delegates.—Dr. A. J. A. Egan, secretary of the Illinois State Board of Health, and Dr. John B. Hamilton of Chicago, are delegates for Illinois to the Quarantine Convention at Memphis, November 17, 18 and 19. Dr. A. R. Reynolds of the Chicago Department of Health is the delegate for Chicago, and Dr. J. C. Sullivan of Cairo the delegate for that city.

Sanitation in Mexico.—Information from Mexico City, November 5, is to the effect that the government is taking measures for carrying out the sanitation of Mexican Gulf ports. It is believed there that when the American Government completes the reconstruction of the sewerage system of Havana and cleans out the bay, with moderate care in Mexican Gulf ports, yellow fever can be stamped out.

The Bubonic Plague.—United States Consul Hurst, at Vienna, dispatches to Washington, D. C., that three deaths have occurred from bubonic plague, and that there are now only six cases in the entire city, and these are all hospital attendants. Mr. Hurst adds that the infection of immigrants is improbable, ample protection against possible infection of suspects, or in fact any who have been in contact with infection, being provided.

Support of Illegitimate Children.—The new Code to go into operation throughout the German Empire in 1900, provides that the man who has had relations with the mother of an illegitimate child between the 182d and the 302d day before the birth of the child, is to be summoned before the justice of the peace and compelled to assume the pecuniary obligation of paying a certain small amount annually for its support until it is fourteen. If there are several men they must raise the amount collectively. There is no question of paternity. The relations are merely those of debtor and creditor, and the proceedings in the court are private. The child belongs to its mother, but

the certainty of its support prevents infanticide and desertion, and places the burden where it belongs. The man can also adopt the child if he wishes, even without marriage with the mother, and confer upon it all the legal rights of a legitimate child. Somewhat similar legislation has proved very effective in Great Britain, and the *Semaine Méd.* is urging its introduction into France.

Yellow Fever.—The increase of yellow fever at Havana has caused the United States Government to seriously consider the problem of landing an army of unacclimated volunteers to take possession of that city a few weeks hence. Nothing toward cleaning and disinfecting can be done until the American troops are in complete control. The original occupants are less capable and less disposed than ever to be sanitarians, now that their departure is so near. The few weeks of delay may prove a sacrifice of many lives.

Santiago Healthful.—Gen. Leonard Wood, governor of the military department of Santiago, under date of November 1, authorizes the statement that during the last sixty days there has not been a case of yellow fever. With warm commendations of the Red Cross Society for their continuous help and for their supplies, which have been effectively distributed by officers of his own appointment, he warns against fictitious tales of suffering and asks that hereafter all the applications be referred to him for endorsement. It is now expected that much before the close of the month the staff of the yellow fever hospital will be abolished. It has been maintained merely to care for a few suspected cases, and with the cooler weather its further services are not needed.

Military Sanitaria for West African Troops. The King of Belgium has evinced an alert attention to the sanitary well being of his Congo State troops. One of the greatest drawbacks to the expansion of European rule in West Africa is the deadly climate and the difficulty of dealing satisfactorily with fever-stricken troops. If they remain at their posts they run every risk of succumbing; if they are brought back to Northern Europe the sudden transition from a tropic temperature to the chills and damps of their own countries may also prove disastrous. King Leopold, therefore, has in view the establishment of a sanitarium within reasonable touch of the Congo territories, which shall be at once genial and free from malaria. Northwest Morocco was at first suggested, but a second and decidedly better scheme has presented itself and is in a fair way of being carried through. The Canary Islands are considerably nearer the west coast than is Morocco, and lie in the direct route of the Congo steamers. Their climatic conditions are too well known to medical men to need any remarks. A medical commission has left Antwerp for Las Palmas to choose the site for the sanitarium and the King has placed 25,000 francs at the head of the subscription list by which the necessary funds are to be raised. It has always been the custom of our military medical service to provide hospital steamers for the reception of fever cases among our troops whenever large numbers have been on active service in malarial districts, but the establishment of a permanent sanitarium in a climate such as that of the Canaries, within easy reach of our West African dependencies, is certainly a plan well worthy the consideration of the authorities of the Royal Army Medical Corps. English troops are constantly quartered in those districts, and many valuable lives might be saved to our army by such an institution.—London *Lancet*, October 22.

Local Inspection of Water-Supplies.—Dr. Thresh holds the opinion that it is the exception to find either public or private water-supplies adequately protected. In fact, he would take a still more serious view of the situation, and say that it is the exception to find such supplies protected at all, except in the crudest manner. Dr. Thresh's remedy is legislation and education. Both are powerful agents, and to the latter unqualified support may be given. There is room for discussion as to the best legislative means to be adopted, as was recognized by the parliament when it refused to insert the clauses introduced by the local government board in certain private water bills, as being of the nature of limited legislation on an important subject. Dr. Thresh suggests, as a basis for future legislation: 1. That sanitary authorities should have power to close any shallow well which can be proved to be liable to pollution. 2. That no shallow wells shall in future be made until the site selected has been approved by the medical health officer for the district. 3. That sanitary authorities should be empowered to make by laws having reference to the construction of such wells. That control of water supplies by an authority is necessary, all will admit, and that such control should rest to a large extent with the sanitary authority, is doubtless desirable for many local reasons; but that it would be wise to vest in that officer the ultimate control of the water supplies in his district we venture to doubt. The water supply of a district is ultimately a physiographic question; and geologic formations are not coterminous with administrative districts. A central water authority is the only solution of the control question. On it should rest the responsibility of opening wells, while the local sanitary authority might wisely be entrusted with their enforced closure. Most hygienists will agree with Dr. Thresh when he says, "I am strongly inclined to think that all public supplies, whether owned by sanitary authorities or water companies, should be under the supervision of some higher authority."—*British Medical Journal.*

SOCIETY NEWS.

Washington Microscopic Society.—At the regular meeting of this society, held November 8, the program was "Abstract of Foster Lecture on the Physical Bases of Psychic Events."

Columbia Historical Society.—At the meeting of the society held in Washington, November 1, Dr. Samuel C. Busey read a very interesting paper on the history of daguerrotypy in Washington.

Southern Kentucky Medical Association.—The semi-annual meeting of this Association was held at Russelville on November 2. Dr. M. E. Alderson of Russellville was elected president and Franklin chosen as the next place of meeting.

Wyoming State Medical Society.—The second regular meeting of the society convened in Rock Springs, November 1, under the presidency of Dr. R. Harvey Reed. The program was full and the papers elicited a good discussion. The society passed resolutions condemning the Anti-vivisection Bill now pending in the Senate, also the granting of a patent on diphtheria antitoxin to Behring, and recommending the establishment of a National department of public health, with a physician as cabinet officer at its head. The society was entertained by Drs. Reed and Freeman and the citizens of Rock Springs, and the meeting will do much to organize and unify the medical profession of Wyoming. The following officers were elected for the ensuing year: President, Dr. R. Harvey Reed; first vice-president, H. J. Maynard; second vice-president, G. G. Verbryck; third vice-president, E. E. Levers; secretary and editor, E. Stuver; treasurer, C. H. Solier. The next meeting will be held in Laramie City on the second Tuesday of October, 1899.

Washington Obstetrical and Gynecological Society.—The two hundred and eighty-seventh meeting of this Society was held November 4, at the residence of Dr. Van Renssalaer. Dr. H. B. Deale read the essay of the evening, entitled "Constipation in Infants." He limited his remarks to young breast-fed infants, and recommended the cure of the infant through hygienic and dietetic treatment of the mother. An interesting discussion followed, participated in by Drs. Acker, Sprague,

Smith, Winter, H. L. E. Johnson, Balloch and S. S. Adams' Dr. Stone reported a case of death from sepsis, after an operation for ventral fixation. He also presented the specimen and gave the history of a case resembling abdominal pregnancy. The Fallopian tube and tumor were referred to the microscopic committee.

Philadelphia Pathological Society.—At a meeting of this society, held November 10, Dr. George E. de Schweinitz presented several mounted specimens of sarcoma of the choroid and sectional drawings, together with micro-photographs and stained specimens of metastatic carcinoma of the choroid. Glioma of the retina was also spoken of. Dr. de Schweinitz thought his specimens of metastatic carcinoma of the choroid the twenty-seventh on record. Dr. J. H. Jopson read a paper, and presented a specimen showing epithelioma of the penis. He stated that a superficial section, optained previous to operation only, showed the growth to be papillomatous, but deeper sections obtained afterward revealed its malignancy. Dr. Joseph Sailer read a paper, and presented specimens of a species of worm he had discovered and identified as being the louse of strongylus pneumonia in sheep, an epidemic disease which has proven to be very malignant in certain regions of the State. Dr. John M. Swan presented a case of anomalous position of the cecum, showing that its position had been maintained in the epigastric region during the life of the patient.

Third Pan-American Medical Congress—Postponement.

INTERNATIONAL EXECUTIVE COMMISSION OF THE PAN-AMERICAN MEDICAL CONGRESS.
OFFICE OF THE SECRETARY, CINCINNATI, NOV. 5, 1898.

My Dear Sir:—I have the honor to announce that in April, 1898, I received from Dr. José Manuel de los Rios, chairman of the Committee on Organization of the Third Pan-American Medical Congress, a request that, in consequence of the then existing rebellion in Venezuela, no definite arrangements be made at that time relative to the meeting of the Congress previously appointed to be held in Caracas in December, 1899.

The following communication relative to the same subject is just at hand:

CARACAS, Sept. 25, 1898.

Dr. CHARLES A. L. REED, Secretary of the International Executive Commission, Cincinnati, Ohio:

Dear Sir:—After having sent my communication dated April last, I find it to be my duty to notify you, that although the considerations pointed out in it have already ended, our country has been scourged by smallpox, which has taken up all our physicians' activities and time, depriving them of going into scientific works. And, as that state of mind of our people and government after such calamities as war and epidemic, would greatly interfere with the good success of our next meeting, I beg leave to tell you, in order that you will convey it to the International Executive Committee, that our government and this commission would be grateful to have the meeting which was to take place in Caracas in December, 1899, adjourned for one year later, I am, dear Doctor, yours respectfully,

THE PRESIDENT,
(Signed) DR. JOSÉ MANUEL DE LOS RIOS.

In accordance with the request of the Government of Venezuela and of the Committee of Organization, the Third Pan-American Medical Congress is hereby postponed to meet in Caracas in December, 1900.

For the International Executive Commission.
CHARLES L. REED, Secretary.

Medical Society of Kings County.—The appellate division of the supreme court of New York has reversed the mandamus procured by the oldest medical society having its headquarters in Brooklyn, by which it was relieved from the payment of taxes on real property. The mandamus having been appealed by the Board of Assessors, the latest ruling will require that the society shall pay the bills for taxes, amounting to several hundred dollars. Judge Woodward, who wrote the decision for the appellate division, said that the theory of the law disfavored exemptions from taxation, except in that class of cases where the property is to be put to some use calculated to minimize the expense of government. The society grounded its petition for exemption on the establishment by it of an organization for mental improvement and for certain educational and charitable purposes. This, according to the decision of the court, is most commendable in the physicians making up the medical society, but it does not entitle them to exemption from taxation under the laws of this State. There is no allegation that the society is organized for the exclusive purpose of carrying out any of these objects, and if there was it would still fall short of the requirements. There is no claim that the purpose of the society is to improve the morals of either men or women, or that it is for religious, missionary, hospital, patriotic or historic purposes. In other words, the society is performing no service of a character calculated to relieve the burdens of government more than a thousand other mutual associations or corporations designed for the promotion of the individual development of its members. It is in effect a medical club house, where the members of a single profession meet for "mental improvement" and such incidental benefits as flow from association and co-operation of effort.

Washington Medical Society.—At the meeting held November 9 Dr. D. S. Lamb presented the heart from a 13-year-old boy, and gave the following history: While climbing a fence the child accidently thrust a needle into the heart. In extracting the needle a portion remained. For two days the patient suffered no evil effects; at the end of that period he fainted and suddenly died. Autopsy showed a portion of the needle in the heart just below the pulmonary valve. Death was caused by hemorrhage and pressure. He also presented a case of ulcerated carditis with abscess of spleen. The heart showed vegetations in the aortic and mitral valves. Organism causing disease not known. Dr. J. Taber Johnson presented a calcified myoma of the uterus, which he removed from a patient aged 61 years; she had had the tumor for twenty years. Three years ago she had a sudden abdominal enlargement with febrile symptoms; several gallons of fluid were drawn off and the mass connected with the uterus removed. The mass had undergone calcareous degeneration and resembled a fetal head. Dr. Fry presented a dermoid cyst in the right ovary. The patient was 38 years of age, and was supposed to have suffered from floating kidney in its normal position. The left ovary was also found to be cystic. The dermoid contained hair, teeth and bones. The other ovary contained a similar kind of fluid, and was supposed also to be dermoid. Dr. Fry read a paper entitled "Antistreptococci Serum in Puerperal Sepsis." Dr. Fry was one of a committee appointed at the last meeting of the American Gynecological Society to investigate the use of serum in the treatment of puerperal sepsis. He referred to the Paris Maternity, where in a case 8 c.c. of serum were used on the first day, with no effects. The second day 8 c.c. better, and the third day 25 c.c. was used, followed by improvement and convalescence. Of 119 cases reported 77 were cured, 42 died—35 per cent. mortality—consequently this mortality is higher than the modern antiseptic treatment. He considered the treatment indicated only in cases of streptococci infection, and bacteriologic investigation necessary. Of 46 inquiries, 14 were favorable and 35 unfavorable. Barton Cook Hurst has no faith in it. R. C. Norris uses it in all cases, and considers his life saved by it. Munde, three cases, is pleased. E. P. Davis, total failure in many cases, but great success in others. It is called for when free flushing fails. E. P. Reynolds says it controls chills. Dr. Fry thinks it has a limited field: 1, the cases must be of streptococcus infection; 2, stage of disease is important—too late when streptococcus is in the blood, consequently should be given early. If local, the patient suffers most from ptomain poison. Serum is of benefit when given in doses of 5 to 10 c.c.; bad cases require larger doses. Fatal cases have rapid pulse, low temperature and uncontrollable vomiting. He thinks curetting harmful in streptococcus in-

fection, except when necessary to remove diseased tissue. Curette valuable only in sapremia. He cited two cases: In one, abortion, patient had delirium, cough, temperature 105; serum given and transfused; grew worse and died; laparotomy showed necrosis of uterine wall, supposed to have been punctured with an instrument. Concerning the use of thyroid extract in uterine fibromata, he claimed it reduces tumor and controls hemorrhages. He reported four cases: two young women with hemorrhage and two after menopause; all improved. Long-continued use of drug causes anemia and palpitation.

NECROLOGY.

LOUIS BOWER, M.D., St. Louis, Mo., died in New York City, November 5, aged 84 years. Born in Stettin, Germany, of poor parents, he put himself through school by teaching, and soon after his graduation was appointed district surgeon to look after the poor and needy. The district of Stolb sent him to the lower house of the Prussian Reichstag, and there he championed the cause of the democrats to such an extent that he was sent to prison, but while in jail was re-elected. Before he took his seat he discovered that the Government feeling was such as to necessitate his flight, and he settled in London. After his flight the German Government passed sentence on him and decreed that he should spend eleven years in prison. This sentence was in force until 1870, when a general amnesty was extended to all political refugees. In 1854 he settled in Brooklyn, N. Y., and there helped found the Long Island College Hospital. In 1869 he located in St. Louis, and there founded the College of Physicians and Surgeons, but after three years gave it up. Shortly after, he again started it and was its Dean until three years ago. Probably his best known work is "Orthopedic Surgery." He also translated many German works into English.

A. M. MILES, M.D., Harvieland, Ky., died on the 2d inst. of consumption, after a long illness. He had recently removed to that place from Shelby County.

PERRY H. BENSOOTER, M.D. of Peely, Pa., died at Lexington, Ky., of typhoid fever, November 4, on duty as contract surgeon at Camp Hamilton. He was a graduate of Jefferson Medical College, and 30 years of age.

F. L. BETTERLY, M.D., Wilkesbarre, Pa., died November 3, aged 67 years. During the Civil War he was surgeon of the One Hundred and Sixty-fifth N. Y. Infantry, and later major of the same regiment.

D. R. DEWEY, M.D., North Adams, Mass., died November 5 from disease contracted at Chickamauga, while on duty as an army physician.

JOHN HELM, M.D., N. Y. University, 1861, died November 7 at his home in New Brunswick, N. J., after a long illness. He was a veteran of the Civil War and had been a member of the Board of Education for eleven years.

CARL ENGLEHARD, M. D., Chicago, November 6, aged 64 years.——J. St. Pierre Gibson, M.D., October 31, aged 66 years.——F. S. C. Grayston, M.D., Huntington, Ind., November 6.——John H. Kappel, M.D., Fort Wayne, Ind., coroner of Allen County, October 31, aged 28 years.——J. M. Marsh, M.D., Delphos, Ohio, November 2, aged 35 years.——Fred. Merrick, M.D., Barclay, Md., November 4, aged 36 years.——J. H. Mullens, M.D., Waco, Texas, October 30.——Abraham H. Robinson, M.D., Concord, N. H., October 31, aged 85 years.——G. Rutz, M.D., Port Townsend, Wash., November 1, aged 68 years.——Christopher C. Sharp, M.D., New York City, November 5, aged 77 years.——Frank P. Thompson, M.D., St. Louis, Mo., November 5.

MISCELLANY.

Tabetic Atrophy of Optic Nerve.—Silex found forty-four syphilities out of fifty-four cases of tabetic atrophy of the optic nerve. Twelve had undergone a thorough specific treatment; eight had been treated for years; fourteen with inunction cures and the rest with pills. He concludes that even the most thorough treatment is not always able to prevent the development of this affection. He found all treatment of the atrophy ineffectual; electric, potassium iodid, strychnin, argentum, etc., administered in all kinds of ways. The only possible means to retard the development of the affection is with strengthening therapeutics to tone up the organism, especially the nervous system.—*Vienna klin. Rund.*, October 30.

Gasserian Ganglion.—In the *Am. Jour. of the Med. Sci.* for November, Keen and Spiller present "Remarks on Resection of the Gasserian Ganglion," with the following method for the preservation of the eye in that operation: Either immediately before or at the close of the operation disinfect the eye and sew the two eyelids together by two or three stitches, near the margins, drawing together only the middle of the lids. This leaves the two ends open sufficiently, first, for washing the space between the lids and the eyeball with a warm boric acid solution, to wash away any mucus, and also leaves enough space to observe the cornea when the patient looks strongly to one side. This occlusion of the lids should last not less than four or five days, when the stitches may be cut and the eye immediately covered with a Buller shield, i. e., a watch-glass held in place by means of either a circular fenestrated disc of rubber plaster or by four separate pieces of plaster. The shield should be used from ten days to a months after the operation.

Large Excision of the Omentum.—Montini describes, in the *Gazz. d. Osp.* of September 11, a case of strangulated hernia with threatening symptoms, in which the hernia only contained a small normal intestinal loop, with a very large amount of gangrenous omentum, which he was compelled to excise. The patient made a good recovery, and has shown no disturbances from adhesions to date, although the excised portion of the omentum was about 40 cm. square.

Adherent Retroposed Uteri.—Pryor (*Med. News*, October 29) enters the pelvis at its lowest point, through the posterior cul-de-sac, in three cases, and finds suturing necessary only when large portions of the ovary are removed, opening small sprouting vessels. He considers that this method allows conservatism as in no other method of operation. Following thorough preparation of the vagina the uterus is curetted and then, selecting the fold behind the cervix which marks the reflection of the vagina, he enters Douglas's cul-de-sac. After digital exploration the incision is spread laterally until the posterior retractor can be introduced. The uterus is then "lifted up into the abdomen by the curved trowel and several gauze pads are inserted into the pelvis." The patient is then put in Trendelenburg's position, when the operator is enabled to see and treat the adnexa as desired. Drying the pelvis, after the operation, iodoform gauze is introduced just within the incision and "these and the uterus replaced *en masse*, the cervix being forced as high as the vagina will permit," and gauze packed lightly around the cervix "until that portion of the vagina which is above the levator ani muscle is almost filled. A stout roll of gauze is then made, varying in thickness and length to suit the width of the vagina" and inserted above the levator ani fibers; in front of the cervix, its ends in the lateral pelvic cavities; the cervix is thus kept anchored.

Rupture of Symphysis Pubis During Labor.—In the *Am. Jour. of Obstet.* for October, De Lee reports two cases, one where the child was delivered spontaneously, the other after prolonged and difficult extraction. Later, in the latter, operation revealed a large abscess around the pubic joint, which was ruptured, the ends of the symphysis being three-quarters of an inch apart and much evoked.

Anthrax of the Lungs.—Schottmuller observed two cases in persons employed in sorting rags and wools, in which infection had evidently occurred by inhalation of the germs. The diagnosis is difficult, but is indicated by severe cyanosis such as only accompanies pronounced disturbances in compensation, and also by severe collapse after slight exertion. There is usually a pleural effusion but no certain indications of pneumonia.

The very high temperature at first falls below normal in the course of two or three days. The prognosis is very grave.—*Munich Med. Woch.*, No. 39.

Composition of Diphtheria Toxin.—P. Ehrlich states that besides the essential toxin in diphtheria poison there are other substances very much less toxic, "toxoids," which are important, however, as they bind the antibodies the same as the essential toxin. As a diphtheria bouillon culture stands, the toxin diminishes while the toxoids increase. He classifies the toxoids as: protoxoids, which have a stronger affinity for the antitoxin than the genuine toxin; syntoxoids, which have the same affinity as the toxin; and epitoxoids, which have less affinity. He considers the latter a primary product of the bacillus and not a transformation product of the diphtheria toxin, and calls them "toxones." These toxoids and toxones are not simple substances, but can be subdivided into what he calls proto, deutero and tritoxins. His research proves that in the diphtheria toxin molecule there are two independent atom-complexes. One is haptophorous, that is, it binds the antitoxin; the other is toxophorous, the cause of the specific toxic effect. Experiments on frogs disclosed that the first exert their effect even when cold, but that the toxophorous require warmth before they can affect the cells. This difference in time explains the incubation period. There seems to be a further possibility that the protoxoids are able in certain circumstances to effect a direct cure by forcing the toxin out of its combination with the elements of the tissues, by means of their stronger affinity for it.—*Deutsche Med. Woch.*, No. 38.

Army Medical Examining Boards.—Several boards of army medical officers are or have been recently in session for the examination of medical men for position or promotion. One board, convened at the Army Medical Museum, examined medical officers of the army for promotion in accordance with the requirements of the existing law. Another board for the same purpose was convened in Santiago, Cuba, to obviate the necessity of sending the officers concerned home for examination. A third board, to which greater interest attaches, is examining candidates for appointment as assistant-surgeons at the Army Medical Museum Building. This Board consists of Colonel Dallas Bache, assistant surgeon general; Majors J. C. Merrill and Louis A. La Goode, surgeons U. S. A.; Major Geo. E. Bushnell, surgeon U. S. Vols., and Captain E. L. Munson, assistant surgeon U. S. A. There are fifteen actual and also some prospective vacancies to be filled, but it is said that the Board will probably succeed in filling them, as the professional qualifications of the candidates are above the average. Another board was convened in the same building, November 2, consisting of Major Walter Reed, surgeon U. S. A., Major Victor C. Vaughan, division surgeon U. S Vols., and Captain George D. De Shon, assistant-surgeon U. S. A., for the examination of acting assistant-surgeons. Until recently the current work of the Army Medical Department was so great and the need for assistance so pressing that contracts were made with medical men on the strength of the letters of recommendation which they had filed with their applications for position. Now, however, it appears that candidates for these positions will have to demonstrate their professional qualifications before getting an assignment to duty.

For Female Contract Nurses in the Army.—Surgeon-General Sternberg has issued a Circular defining the status, duties, and privileges of contract female nurses as follows:

Contract and Duties.—The contract which is made by the Surgeon-General with a female nurse for Army service is for an unlimited period. In signing this contract and taking the oath of office a nurse is understood to promise that she will perform the important duties entrusted to her with unwavering devotion to the welfare of her patients and with the dignity of demeanor which is essential for Army service. Reports of each nurse are sent to the Surgeon-General, and on these reports action is based.

Pay.—While under contract a nurse receives $30 a month salary; payable either on pay rolls or vouchers. While nursing at a hospital she receives also her lodging, board and laundry of uniforms. Expenses incurred for these things by a nurse will not be refunded.

Uniform.—No uniform for nurses has as yet been prescribed, but for the present a nurse is expected to furnish and wear such dresses, aprons and caps as are usually considered suitable.

Chief Nurse.—If the surgeon of a hospital so requests, the Surgeon-General may appoint a chief nurse, whose duty it shall be to look after the welfare of all of the nurses in the hospital; to see that they are comfortable and that they receive attention when ill; to assign each to her specific duty and see that the hours of such duty are strictly kept. She is also expected to have supervision of the general department of the nurses and to perform such other duties as the surgeon may direct, but not to undertake nursing herself.

Traveling Under Orders.—After signing the contract a nurse is subject to military discipline and must promptly obey any order given her. When traveling under orders she must not stop on the way. She must not, under any circumstances, leave her post or take any journey without written authority from the Surgeon General or from the surgeon under whom she is serving. When traveling under orders she will be furnished in advance with transportation. This means an order for her railway ticket and sleeping-car berth, which are exchanged by her at the station for regular tickets.

Leaves.—A nurse will not receive pay for time absent from duty unless given by the surgeon—*in writing*—a sick leave or leave of absence "with pay." This must be for a specified time, one week before the expiration of which the nurse must report in writing to the Surgeon General for orders, unless she already has orders to return to her former place of duty. Should her services not be needed at that time the Surgeon-General may annul her contract. While on leave with pay the nurse is entitled to commutation of rations at the rate of 25 cents per day. To obtain this she must, when she returns to duty, apply to the surgeon, who will endorse her papers of leave and forward them to the nearest commissary.

Leave of Absence.—When a nurse is granted leave of absence at her own request, she does not receive pay for the time absent, unless the surgeon grants—*in writing*—a "leave with pay," which can not exceed ten days or be allowed soon after entering the service. As she is not traveling under orders she does not receive transportation.

Sick Leave.—In case of sickness contracted in the line of duty, a nurse is entitled to medical attendance either in her quarters or at the nearest available army hospital. But if she prefers to return home, or to some other hospital, the surgeon may grant a sick leave with pay (for thirty days). If the surgeon also gives her written orders to proceed to her destination, she will then be entitled to transportation, as explained above. In such a case another nurse may, if necessary, be ordered to accompany her, and transportation furnished her also. If unable to return to duty at the end of the sick leave, a certificate from the attending physician stating this fact, and the probable date when the nurse will be fit for duty, must be forwarded to the surgeon granting the sick leave or to the Surgeon General, if she has no station. This certificate is sufficient to cover absence for the term specified therein. Bills for medical attendance can not, under the regulations, be allowed.

Transfer.—Transfers from one hospital to another are ordered only when the necessities of the service require it. The preference of a nurse is consulted whenever possible, but she is expected to remain at the hospital to which she is assigned so long as her services are needed there. Nurses who go to Porto Rico or Cuba are expected to remain at least six months, if their services are satisfactory.

Annulment of Contract.—The contract of a nurse may be annulled at any time by the Surgeon-General or by his direction. A nurse is not expected to request such annulment before the expiration of two months, unless able to give satisfactory reason therefor.

Transportation, as above defined, is given on annulment of contract, except when "for misconduct or neglect of duty."

Transportation will be to place of making the contract, except that when made at the place of duty it will be furnished to the place designated in the contract as her residence.

The War Investigating Committee.—The following is the testimony of the volunteer medical officers of the army before the Committee of Investigation, at the sessions held in Chicago, Nov. 7-10, as reported in the daily press:

Dr. Lewis Schooler of Des Moines, Iowa, was the first wit-

ness. From June 7 to July 17 Dr. Schooler was stationed at Camp Thomas as chief surgeon of the Second Division, Third Corps. Questioned by Dr. Conner, he said that during the time he was there the sanitary conditions in the hospital were not very good; that the sinks in the whole division were bad, owing, principally, to the character of the ground, and that the discipline was rather lax.

"At the opening," said Dr. Schooler, "there were practically no facilities for the care of the sick; we were short of medicines and had no apparatus by which the stewards could prepare the medicines we had. The regimental hospitals, all but one or two, were as poorly supplied with medicines as the division hospitals. Requisitions were made for more, but they were generally disapproved at the camp headquarters. I do not know that the requisitions were absolutely turned down, but they were frequently reduced. It was in reference to the quantity rather than to the articles themselves that difficulties arose. I think the supply department issued stores according to its ability, but not always with promptness. It had certain hours for issuing supplies, and at other times nothing could be obtained.

"There was a scarcity of beds in the hospital, but I never saw a man lying on the ground. I went through the hospitals every morning and inquired of every man able to speak if he had been neglected in any way. Very seldom was there a complaint from a man who was really sick. Sometimes they complained about the lack of medicines. Occasionally patients recovering from typhoid fever complained about the diet, just as any convalescent fever patient would do at home. So far as I know there was never any patient neglected to such an extent that his chances of recovery were materially reduced. At one time practically half our nursing force was sick or in the guardhouse for insubordination."

Dr. Conner—Why was not a demand made by somebody that better or more nurses should be sent to that place?

Dr. Schooler—I don't know. I wrote the surgeon general once, protesting against the difficulties of securing supplies. Part of the blame rested upon the quartermaster's department.

Asked to give, in as few words as possible, his opinion about the general conditions at Camp Thomas during the time he was stationed there, Dr. Schooler said:

"In the first place, the quartermasters and surgeons could not agree as to the number of tents we should have. Colonel Lee contended that we were limited to a certain number of tents, seventeen I think it was in the beginning. We afterward prevailed upon him to give us twenty one. His contention was that he could not issue tents beyond the prescribed number. I think he based the number of tents upon 150 patients, and when the number of patients became greater we could not make him understand that we had to have more tents. It was his refusal to increase the number of tents that made the overcrowding.

"The lack of medicine, the lack of trained nurses and the lack of a sufficient number of surgeons was a material difficulty. One cause of the prevalence of sickness in the camp was that we had three regiments who came there with a great deal of sickness—the First Mississippi and the First and Second Arkansas. There was much typhoid and dysentery in these regiments. I think the quartermaster's department was largely responsible for the great sickness; the medical department (that is the supply department) was also responsible for some things. Then we lacked facilities to make reports on—did not even have stationery. We were told all the time that reports must be made."

Dr. Conner—So far as you know, was there on the part of any medical officer or surgeon any wilful neglect in the care of the sick?

Dr. Schooler—No sir. The great difficulty was in obtaining supplies, and I think the hitch came between Colonel Hartsuff and the medical supply department.

Dr. Schooler said he never knew Dr. Hubbard to force medicine down a patient's throat, as had been charged, although he though that might sometimes have been necessary if the patient were delirious. He said he never knew of patients in any considerable numbers being kept in regimental hospitals until they were moribund and then sent to division hospitals. For the successful care of the sick, Dr. Schooler considered the division hospital far superior to regimental hospitals.

"I left July 17," he said, "before any epidemic had set in. In my judgment the responsibility for the continuance of the conditions there does not rest upon the division surgeons. If there is any responsibility it rests somewhere else. The surgeons in our division were hard working and faithful."

In regard to the water-supply at the camp, Dr. Schooler stated that he did not think any of the surgeons in his division considered the water fit to drink. There were not enough teams at the disposal of the officers to enable them to bring sufficient water. When asked for his reasons why he considered the water unfit to use the doctor said that upon several occasions he had visited the ground around where the supply was taken from the river and felt convinced from what he saw that much of the prevailing disease was caused by the negligence of the policing department in allowing the soldiers to go at will through the woods situated along the banks of the stream. He gave this as a reason for many of the cases of typhoid fever existing in the camp.

Another feature which contributed largely to the sick list in the opinion of the Doctor was the laxity shown in issuing passes to the men and allowing them to visit other camps. "Fifty per cent. of the sickness," said the Doctor, "would not have been in existence had the men not been allowed to leave Chickamauga Park on passes." He gave as his opinion that the medical officers were hampered too much by officers of higher rank, but who had no medical training. In regard to division hospitals the Doctor said:

"I think there should have been a hospital at Chattanooga where patients could have been taken who were going to be sick any length of time. The division hospital was never intended for this class of patients." When questioned as to the lack of nurses, the Doctor said he thought both the nurses as well as the officers were overworked.

In many cases one nurse was compelled to take charge of twenty, thirty and sometimes forty patients during the night, which was too much to expect of one person. No blame could be attached to the doctors, as they would start out in the morning on their rounds of duty and would be on duty until late at night. When questioned as to the complaints about starvation, the Doctor said that a great many of these were entirely unwarranted. As to the general conditions surrounding the patients in the hospital, the Doctor gave it as his opinion that the average soldier was just as well treated there as he would have been at home, excepting, perhaps, in the line of bathing. In this direction he possibly might have received more attention, but this only affected the comfort of the soldier and did not necessarily affect the mortality in camp.

Dr. Nicholas Senn said:

"When I reached Chickamauga there were 40,000 soldiers encamped there. There were already a good many cases of typhoid fever and the disease was spreading rather rapidly. I do not believe it would have been possible to isolate the patients so as to keep it from spreading. Chickamauga was an ideal camp for a short period, but for a prolonged camp I considered it dangerous. The typhoid fever was brought there, it was spread by flies, and the sewerage and sanitary arrangements were imperfect. These conditions made disease inevitable. The sinks were properly dug, but they were not properly policed. The hospital arrangements were as good as could be expected."

Dr. Senn was next questioned about conditions at Santiago and Siboney. He said hospital supplies were scarce and the medical force was small; yet the materials at hand were so well utilized that the number of deaths was comparatively small. The supplies, he said, could not be landed for want of lighters. Speaking of the treatment of sick soldiers brought North on the *Relief*, he said:

"The *Relief* was a model hospital ship. I came North on her, and there was space for 250 passengers, while she carried only 147. The men were well cared for. We had six female nurses and eighteen male nurses, and the nursing arrangements were as perfect as possible. The sick had the best care it was possible to receive on a ship. When the *Relief* went back to Porto Rico I went with her. She carried everything needful in the way of hospital supplies, and indeed was a relief ship. At Porto Rico the sick had better care than those in Cuba, as the supplies were more generous. I accompanied the ship North again when the sick she carried were landed at Montauk Point.

"Do you know whether any transport left Porto Rico carrying 170 sick men, with no medical supplies?" asked Dr. Conner.

"If such was the case I never heard of it."

Speaking of the conditions of Montauk Point, Dr. Senn said for a short camp it would have been all right, but the location was such as would foster disease where it was occupied for a long time. Regarding hospital arrangements he said:

"The hospital construction at Montauk was the marvel of this short war. I don't believe any war, recent or remote, can furnish an example of such perfect hospital accommodations furnished in such a short time. The equipment was luxurious. The government gave us everything we asked for in the way of delicacies, and the Red Cross spent $2000 a day there. The sick soldiers lived in luxury. Of course there were times

when there was congestion, but this could hardly be avoided, as ships were landing men nearly every day."

Dr. Senn said the only criticisms he had to make were a lack of co-operation between the quartermaster's and the medical departments, which delayed supplies, and the detailing of medical officers to executive work, when their attention would have been better directed to surgical work.

Dr. Milo B. Ward of Kansas City, Mo., who was a brigade surgeon at Camp Thomas from July 12 to September 10, when asked as to the condition of the hospitals, said that there was a great lack of medicine, only some of the simplest being on hand. He said that the food would have been all right had it been properly cooked. He said he knew of several cases where the patient was allowed to lie on the ground the whole day and also during the night before taken to the hospital.

Seventy-five per cent. of the patients were on cots and the other 25 per cent. were on stretchers on the ground. Sometimes at first some of the men were put on the bare ground, but within a few hours they were always put on cots or stretchers.

Dr. Conner—"What was the reason that the Second Division Hospital of the Third Army Corps had the worst reputation of any hospital during the war?"

Dr. Ward—"The first reason, in my judgment, is that the hospital had for its corps surgeon a man who never paid any attention to it whatever. His name was Hoff. The next reason is that the man in charge of the hospital, the division surgeon, seldom visited the hospital or paid any attention to it. His name was Jenney. The next reason is that there were not enough doctors at any time to take care of the patients without overworking the doctors and making them too ill to get out of bed.

"The stores that were necessary were not available from the army supplies. Milk and ice were obtained from other sources. Had it not been for the Red Cross some of the soldiers would have starved."

Dr. Connor—"Who was responsible for this?"

Dr. Ward—"For the condition of the camp, first, the man who insisted that the camp was perfect, and that the hospital was well run. That man was General Boynton. He was responsible for keeping the army there when that army ought not to have been kept there. The want of supplies was due to the fact that the quartermaster's and commissary's department were not hounded enough."

"What was your opinion of the location of the hospital?" was then asked the Doctor.

"The location of the hospital was extremely bad, in my judgment," he replied.

Dr. Wm. Cuthbertson of Chicago was then called to the stand.

"After locating our camp," he said, "we immediately made details to provide for sanitary conditions. The surface soil was shallow, and on digging three or four feet we would strike water. The ground was perfectly non-absorbent and the sinks being used by the men would become in a filthy condition in a short time."

He then went on to show how that, whenever a rain occurred, these sinks would become flooded and thus result in an unsanitary condition. This was the beginning of the trouble. When a requisition was sent in for quicklime with which to disinfect the camp there was no supply of that material. The Doctor then went into details to show how the medical department was handicapped by the lack of many necessary articles for the perfect sanitation of a camp. The question of regimental hospitals as compared with division hospitals was then brought up. It was the opinion of Dr. Cuthbertson that in theory the division hospital was superior, although from his experience he hought that in many cases the regimental hospital was better for the men, as they were then under the charge of physicians who were more liable to take a personal interest in the patient.

Dr. G. A. Smith of Clinton, Iowa, was appointed a brigade-surgeon and served from July 14 to September 10. He was in charge of the hospital of the Second Division of the Third Army Corps at Chickamauga. He was questioned at considerable length.

Dr. Smith—When I assumed my duties at the second division hospital on the 14th day of July I found a shortage of tents and cots. The patients in the hospital were crowded on account of shortage in tents, and some of them were lying on the ground on account of lack of cots. There was no provision made for feeding the sick other than the rations issued to the soldiers in the regular service, except such as were brought in by charitable organizations, principal of which were the Red Cross Society and the National Relief. In the pharmacy there were at that time no intestinal antiseptics, although the commanding officer informed me when I made a requisition for these that he had made repeated efforts to get them. The pharmacy at that time—and, indeed, until it was ordered closed and I turned the stores over to the Government on the 9th of September—never had any proper equipment for doing pharmaceutic work. There were no scales to weigh with and the hospital stewards used a board for a tile and an ordinary jack knife for a spatula. There were no pill-boxes or powder-boxes. The stewards dispensed tablets and pills in any paper they could secure, and they were carried to the wards in that shape, and owing to the prevalence of dampness at night they would become by morning a sticky mass not fit for use.

The medical supplies did improve after the 1st of August, he said, but up to that time there had been a great scarcity of supplies. The water was bad too.

General Dodge—How about the water?

Dr. Smith—The water that was furnished for the use of these hospitals up to August 1 was that taken from the pipe line from Chickamauga creek, and it was so full of sediment that it was simply slush and was not water.

There were no floors in any of the hospital tents at the time I reported for duty at that hospital. The first tent was floored soon after the middle of July, although some were not floored until long after that. The floors in the tents of the Fifty-second Iowa, the First Maine and the Fifth Missouri were all laid after the troops had left the park and were never occupied by the soldiers, and never had cots placed in them. In fact, I might state that the floors were laid after orders had been received to pack goods preparatory to leaving for Anniston.

In regard to nursing in that hospital, we had no trained nurses. All the nursing was done by orderlies, and many of them were densely ignorant, and when I was in charge of the wards of the Second brigade I had two men who could neither read nor write, and three men who did not know the meaning of "A.M." or "P.M." when written.

In regard to the sinks, disinfection and drainage: right back of the tents of the Second brigade there was a cesspool which contained most of the water from the camp, and that remained a stagnant pool until some time in August.

In speaking of the infection of the camp, Dr. Smith said a large part of the typhoid germs was carried around by the flies which invaded the grounds. The water-supply, he said, was not contaminated by sewage carried into it from the camp, but mainly by an inorganic sediment which acted as an irritant on the men's digestive organs and caused, in many cases, dysentery and other intestinal diseases.

Dr. Smith said he regarded Dr. Milo B. Ward, who testified the day before, as a very competent and a very conscientious man, and would not doubt any statements Dr. Ward might make as to conditions at Camp Thomas.

Dr. Smith—I once wrote a report to the Surgeon-General, but I think it never got any farther than General Boynton's office. I was asked by General Boynton and Major Jenney to withdraw it, as it might get me into disfavor personally, but I told them there was nothing in it that I wished to withdraw.

Gleanings.—Acute infection, simulating a cerebro-spinal meningitis in a woman of 61, no syphilis, probably of intestinal origin, causing an abscess of the liver and extensive thrombosis in the vessels of the pia mater of the spinal cord.—*Nordiskt Med. Ark.*, xxi, 2.——Ernest has succeeded in cultivating a bacillus from a case of pseudo-melanosis, affecting the liver, spleen, aorta and kidneys, which reproduced the disease and is evidently the etiologic factor. The bacillus is straight or slightly wavy, from 2 to 16 μ in length, slightly enlarged at one or both ends, motile, liquefies medium and generates an abundance of hydrosulphuric acid. This fact tends to confirm an old theory that attributed the production of pseudo-melanosis to the presence of free iron sulphid in the organs affected.—*Arch. f. Path. Anat.*, clii, 3.——Success of creosote carbonate in children's pulmonary infections, non-caustic and not disagreeable to take.——Cure of large angioma of the lower lip with four treatments with bipolar electrolysis.—*Presse Méd.*, October 29.——Case of complete dislocation of the foot without fracture (except of the bicycle), exclusively on the talocrural joint, the tip of the foot turned inward, the sole outward, the outer edge of the foot in front. Easy reposition in narcosis.——Extirpation of the spleen on account of traumatic rupture, in sixth month of pregnancy, which continued undisturbed to normal delivery.—*Vienna Klin. Woch.*, October 27.——Jonnesco reports 23 splenectomies, all but one for malarial hypertrophy. One died during the operation; seven since from

various causes. The rest much benefited. He agrees with Laveran that the spleen is the receptacle of the hematozoon. Leukemia is the only contraindication to the operation.—*Bulletin de l'Acad. de Méd.*, October 25.——Case of nasal secretions streaked with blue, reported by Molinié.—*Rev. de Laryng*, October 29.

Washington.

Columbian University Hospital.—The college hospital was formally opened for the reception of patients November 1, on which day the dedication ceremonies were conducted. The college building is located within one hundred feet of the medical department and will accommodate thirty patients. Beds have been endowed by Drs. W. W. Johnston, Middleton F. Cuthbert, Gardner G. Hubbard and the First Baptist Church. The following constitute the hospital and dispensary staff: Surgery, Drs. J. Ford Thompson, W. P. Carr, John Van Rensalaer, John Wellington and Frank R. Hagner; medicine, Drs. W. W. Johnston, D. W. Prentiss, G. N. Acker, G. Wythe Cook, T. A. Claytor, B. L. Hardin, Thomas Dowling; obstetrics and gynecology, Drs. A. F. A. King, H. L. E. Johnson, J. W. Bovee, H. S. Medford, V. B. Jackson, J. E. Jones and E. E. Morse; diseases of the eye, Drs. D. K. Shute, W. K. Butler, F. K. Newell; diseases of the throat and ear, Drs. C. W. Richardson, F. P. Morgan; diseases of the skin, Drs. H. C. Yarrow, R. B. Carmichael; diseases of children, Drs. T. E. McArdle, Frank Leech; orthopedics, Dr. A. R. Shands; diseases of the nervous system, Drs. D. W. Prentiss, E. L. Tompkins, Sterling Ruffin, A. L. Lawrence; genito-urinary, Drs. T. R. Stone, W. T. Birch; clinical laboratory, E. A. de Schweinitz and J. E. Carrol; pathology, Drs. Walter Reed, U. S. A., and L. W. Glazebrook; superintendent, Miss A. G. Odell; resident physician, C. S. White. Donations are earnestly solicited from Baptists.

Associated Charities.—The report of the Associated Charities for the past month shows that fifty-three investigations were made of applicants for free medical treatment; forty one were applicants for treatment at the Central Dispensary and Emergency Hospital, and of this number thirty-one were approved, eight were refused and two were found to have given false addresses. Twelve applicants for treatment at the Woman's Clinic were investigated, all of which were found worthy of free treatment.

Report of Medical Supervisors.—The first annual report of the Board of Medical Supervisors of the District, organized under the Act of 1896, has been submitted to the District Commissioners, and shows that 1047 licenses were issued to physicians who were registered previous to the operation of the act; 86 were examined by the board for license, of which number 42 succeeded, 12 failed and 26 were recommended for future examination. Ninty-five licenses were issued to midwives, under the law exempt from examination, and the board remarks, "most of these were given under protest, as the ignorance of the applicants made it impossible for them to comply with the regulations regarding report and registration of diseases." The board recommends that provision be made at one of the hospitals for the education of midwives, as, in the present state of social development, the services of midwives are necessary, but an unskilled midwife is dangerous and her ignorance a menace to public health. The board recommends that a special officer be detailed to investigate alleged violations of the law by midwives and physicians. Six applicants applied for license to practice and were examined; E. L. Lemerle, Wm. H. Hughes, Jr., and Frederick H. Mohart passed successfully and three failed.

Honorably Discharged.—Drs. Auther Snowden and John W. Bayne, majors and surgeons of volunteers, have been honorably discharged from the service. Acting Asst.-Surgeon James R. Church, the hero of the Rough Riders, has returned on furlough and will probably enter the medical service of the regular army. Dr. Church has earned his promotion, and is one of the best equipped surgeons of Washington. He was formerly one of the surgeons of the Central Dispensary and Emergency Hospital, and filled his position with marked distinction.

Health of the District.—The report of Health Officer Woodward for the week ended November 5 shows the total number of deaths to have been 126, of which number 83 were white and 43 were colored. The principal causes of death were: Nervous diseases, 20; circulatory, 16; respiratory, 26; intestinal, 1. There were 6 fatal cases of typhoid fever and 5 of diphtheria. At the close of the week there were 148 cases of diphtheria and 119 cases of scarlet fever under treatment. There were 245 births, of which 115 were white and 130 colored.

Physician to the Poor.—On the recommendation of the health officer, the District Commissioners appointed Dr. Vergil B. Jackson physician to the poor, to serve during the absence of Dr. Battle.

Woman's Clinic.—At the annual meeting of the Woman's Clinic, held November 5, the following officers were elected: President, Mrs. Emily Sherwood; vice-presidents, Dr. D. S. Lamb and Miss Eva Simonton: secretary, Mrs. M. F. Case. The old board of directors, the consulting staff and standing committee were re elected. Drs. Heiberger and Norris were appointed drug committee for the ensuing quarter. The annual report shows 562 new cases treated, 4866 visits made and 6500 prescriptions compounded.

Civic Center.—At the annual meeting of the Civic Center, held November 7, Dr. W. W. Johnston read an interesting paper on the bad effects of school life on the hygiene of children. Dr. Nordhoff-Jung addressed the society on the effect of school life on teachers. Dr. Samuel S. Adams spoke on some of the so-called school diseases. Dr. George M. Kober read an address entitled "Many of the Causes of So-called School Diseases."

Cincinnati.

Appointment.—Dr. Otto Geir has accepted the position of junior assistant physician at the Worcester Insane Asylum, Worcester, Mass.

Laura Memorial Hospital.—This gift of Mr. Alex. McDonald of this city to the Presbyterian Hospital, was formally opened November 1; patients were admitted the next day.

Academy of Medicine.—At the regular meeting, November 7, Dr. Joseph Eichberg exhibited a number of irregular, greenish, non-faceted concretions which had been sent to him under the supposition that they were gall stones. The patient by whom they were passed was supposed to have been suffering from gall-stones and had been given a pint of olive oil; these concretions were the result. By chemic and microscopic means he had succeeded in proving that they were composed entirely of fatty matters. He also thought that these fatty concretions so often passed after the exhibition of a large amount of olive oil, were frequently mistaken for gall-stones. Dr. Henry Bettman read a paper entitled "Some Suggestions as to Diet in Diseases of the Stomach." The principal argument insisted upon by the author was that patients afflicted with stomach trouble, or supposed to be so afflicted, were habitually put upon a too restricted diet. Many of them were being practically starved to death, and the lessening of nutrition only aggravated the condition of the stomach. No dietary could be put down for any one class of patients; every patient is a law unto himself. He believed in the old saw "that one man's meat is another man's poison," and thought that the diet should be restricted only in that which the patient is unable to digest. Those who took part in the discussion were Drs. Zinke, C. R. Holmes, Kiely, Fackler, Oliver, Jones, Eichberg, Johnston, Langdon, J. Louis Brown, Marcus, and M. Brown.

Louisville.

Quarantine Commissioners.—Governor Bradley has appointed Dr. J. M. Mathews of Louisville and Dr. J. B. Kinnaird of Lancaster as delegates to the National Quarantine Convention, in Memphis, Tenn.

Medical Staff.—The medical staff of the Home for Friendless Women has just been organized as follows: Ewing Marshall, chairman; Henry E. Tuley, secretary; Louis Frank and Frank C. Simpson, visiting physicians; Wm. Bailey and Preston B. Scott, consulting physicians; S. G. Dabney in charge of eye, ear and throat department.

GODSHAW.—Dr. C. C. Godshaw, on October 31, was shot by a colored man-servant, the ball entering the abdomen and penetrating the stomach and duodenum. He was able to walk into his house, was shortly removed in an ambulance to St. Joseph's Infirmary, where a laparotomy was done by Dr. A. M. Vance, within fifty minutes of receiving the wound. His condition the next morning was excellent.

BELL.—Capt. Austin Bell of Hopkinsville has been appointed surgeon-major of the Third Kentucky regiment.

ORPHANS' HOME.—A meeting of the board of managers of the Louisville Baptist Orphans' Home was held November 2. Dr. J. B. Marvin is president of the board and physician to the Home. In the past twenty-nine years the Home has cared for 1059 children, of whom one-third came from Louisville. There have been only seventeen deaths in the history of the institution and no fatal accident has ever occurred.

MORTALITY REPORT.—The health officer's report shows a total of 215 deaths during October, against 222 deaths for the corresponding month last year. Consumption caused 19, pneumonia 15, inanition 14 and old age 10. There were 332 births and 58 marriages.

BOWERS.—Dr. Henry Bowers, the physician from this city who is seeking fortune in the Klondike, has written a friend that his prospects are very bright for amassing a fortune. He is practicing medicine, has opened a drug store, and in connection with this is operating a vapor-bath house, which is prospering. He states that the miners are suffering largely from scurvy.

Hospitals.

By the will of R. M. Raab of Burlington, Iowa, who died recently, the Michael Reese Hospital, Chicago, will receive $1000 and the Old Folks' Home $500. Other bequests are: Burlington Hospital, $1000; Mercy and St. Francis Hospitals, also of Burlington, $500 each; Orphans' Home of Atlanta, Ga., $1000; Orphans' Home and Hospital of Baltimore, $1000; Philadelphia Hospital, $1000; Old Folks' Home, Richmond, Va., $500; two other benevolent institutions, same place, $250 each.——Flushing Hospital, Flushing, L. I., has been voted $10,000 by the Board of Estimate and Apportionment, provided, however, that the amount be earned by the institution before it can be received. The Hospital will receive $1 a day for all surgical patients and 70 cents a day for all medical patients.——Fire destroyed the hospital of the Wisconsin Veterans' Home, Waupaca, Wis., November 9. Loss $15,000; insured for $10,000.——The formal opening of the new Samaritan Hospital, Troy, N. Y., occurred October 22.

Societies.

The following recent meetings are noted:

Connecticut.—New Britain Medical Society, November 3.

Illinois.—Chicago Medical Society, November 9; Chicago Medical Examiners' Association and Chicago Medical Society—joint session—November 16; McLean County Medical Society, Bloomington, November 3.

Maryland.—Washington County Medical Society, Hagerstown, November 9.

Michigan.—Barry and Eaton County Medical Association, Hastings, October 27.

Missouri.—St. Louis Medical Society of Missouri, November 12.

New York.—Canandaigua Society of Physicians, Ontario, November 3.

Ohio.—Crawford County Medical Society, Bucyrus, November 4; Union District Medical Society, Hamilton, October 27.

Pennsylvania.—Lancaster County Medical Society, Lancaster, November 2; Luzerne County Medical Society, Wilkesbarre, November 2; York County Medical Society, York City, November 3.

Texas.—Corsicana District Medical Association, Corsicana, October 31.

Wisconsin.—Rock County Medical Society, Janesville, November 4.

THE PUBLIC SERVICE.

Movements of Army Medical Officers.—To Santiago, Cuba, Majors Wm. Dolz and Wm. Stephenson, brigade surgeons, to report to the Commanding General, and Acting Asst.-Surgeon Wm. C. Warmsley from Washington, D.C., via New York City. To Havana: Major Ezequiel de la Calle, brigade surgeon, as sanitary inspector, from duty with the Seventh Army Corps. To Ponce, Porto Rico: Capt. Geo. M. Wells, assistant-surgeon, U. S. A., for duty in the General Hospital. To Manila, P. I.: Lieut. Irving W. Rand, assistant-surgeon, U. S. A., from post duty at Fort DuChesne, Utah.

To Camps in the South—To the First Army Corps: Major Oscar C. Seure, brigade surgeon, from the Sternberg Hospital to report to the Commanding General; Major James D. Glennan, brigade surgeon, to Lexington, Ky., to the First Brigade, Second Division. To the Second Army Corps: To Camp Meade, Pa., Acting-Asst.-Surgeon John S. Schaub, from Leechburg, Pa. To Camp at Augusta, Ga., Acting Asst.-Surgeon R. C. Leonardi, from Fort Huachuca, Arizona, and Major Lewis Balch, brigade surgeon, to the Second Brigade, Second Division. To the Fourth Army Corps: Majors Wm. J. Kernachan and Wm. B. Winn, brigade surgeons, to report to the Commanding General at Huntsville, Ala.; Major John L. Macumber brigade surgeon, to the First Brigade, First Division, and Acting Asst.-Surgeon Rafael Echeverria to duty with the Eighth Cavalry. To the Seventh Army Corps: Major Geo. R. Fowler, chief surgeon Vols., relieved from duty with the Second Division, to report to the Commanding General; Major Paul Clendenin, brigade surgeon, assigned as Chief Surgeon Second Division; Capt. W. F. Lewis, assistant-surgeon, U. S. A., to the Cavalry Brigade; Major Samuel T. Armstrong, brigade surgeon, to report to the Commanding General at Savannah, Ga., and Acting Asst.-Surgeon Frank E. Artaud to Savannah, Ga., to the Fifteenth U. S. Infantry.

To post duty: Capt. Chas. F. Kieffer, assistant-surgeon, U. S. A., to Fort Meade, S. D.; Lieut. Basil H. Dutcher, assistant-surgeon, U. S. A., to Fort Du Chesne, Utah, and Acting Asst.-Surgeon Francis A. Holliday to Willets' Point, N.Y., from Huntsville, Ala.

To General Hospitals, etc.: To the Josiah Simpson Hospital, Fort Monroe, Va., Acting-Asst.-Surgeon Charles F. Craig from the Sternberg Hospital, Ga., to the General Hospital, Fort Thomas, Ky.; Acting Asst.-Surgeon James L. Bevans. To the General Hospital, Fort Myer, Va.: Capt. Wm. F. Lippitt, Jr., assistant-surgeon, U. S. A. To the charge of sick soldiers in Washington, D.C., hospitals: Major John W. Bayne, brigade surgeon.

Sick leave granted: Lieut. B. K. Ashford, assistant-surgeon, U. S. A., and acting asst.-surgeons Henry R. Carter, Jr., John Horn, Ray A. Wilson, Isaac W. Brewer and Wm. E. West.

Honorably discharged—the following Majors and brigade surgeons: Arthur Snowden, John W. Bayne, James M. Kenne and Joseph K. Weaver; Major Jefferson D. Griffith, chief surgeon, Vols., and the following officers of the regular Army (their volunteer commissions only): Lieutenant-Colonels John Van R. Hoff and Valery Harvard, chief surgeons; Majors Adrian S. Polhemus, Charles B. Ewing, R. W. Johnson, Paul Shillock, Ogden Rafferty, Chas. T. Newkirk and Walter D. McCaw, brigade surgeons, Vols.

Resigned: Major Frank Boyd, surgeon Third Ky. Infantry; Lieut. H. M. Smith, assistant-surgeon First Territorial Vol. Inf.; Lieut. D. S. Humphreys, assistant-surgeon Third Miss. Inf. and Lieut. Otway W. Rush, assistant-surgeon, U. S. A.

Annulment of contract: Acting Asst.-Surgeons Frank T. Disbrow and George G. Morris ordered home from Porto Rico.

CHANGE OF ADDRESS.

Bell, S. D., from Phoenix to Fort Apache Indian Agency, White River, Ariz.
Borst, H., from Chicago, Ill., to Oelwein, Iowa.
Beem, E. D., from Kansas City, Kan., to 1117 Holmes St., Kansas City, Mo.
Birkofer, W. J., from Dickens to Bradgate, Iowa.
Campbell, T. F., from Blunt, S. Dak. to Benkelman, Neb.
Dickinson, I. W., from Keswick to Boone, Iowa.
Dwire, D., from Burbank to Wilmington, Cal.
Fowler, W. S., from Chicago, Ill., to Nordhoff, Cal.
Fitzpatrick, G. W., from Temple Building to 409 Garfield Ave., Kansas City, Mo.
Gamble, W. E., from Blue Island Ave. and Harrison to 400 Reliance Bldg., Chicago, Ill.
Huecker, J., from Denver, Colo., to Waupon, Iowa.
Holleman, P. W., from Roseland, Ill., to 255 E. 111th, Pullman, Ill.
Moe, A. J., from La Crosse to Chaseburg, Wis.
McMurchie, from 116 Lysander to Emergency Hospital, Detroit, Mich.
McCurry, I. L., from Hartwell to Toccoa, Ga.
Nichols, C. L., from Omaha, Neb., to 35th and Wabash, Chicago, Ill.
Pinto, A. S., from Panama Park, Fla., to Savannah, Ga.
Parker, D. L., from 835 to 397 Jefferson Ave., Detroit, Mich.
Stockton, S., from 413 N. Delaware to Insane Hospital, Indianapolis.
Soule, C. E., from Chicago to Sheridan, Ill.
Storer, E. E., from Essex to Lacelle, Iowa.
Thomas, F. W., from Marion, Ohio, to Pueblo, Cal.

LETTERS RECEIVED.

Adams, W. A., Little Rock, Ark.; Ammonol Chemical Co., New York, N. Y.; Allen & Hanburys Ltd., New York, N. Y.; Alma Sanitarium Co., Alma, Mich.
Banks, J. N., Indiana, Pa.; Beck, Carl, Chicago, Ill.; Becker, E. C., Chicago, Ill.; Bishop, L. F., New York, N. Y.; Boston Gore and Web Mfg. Co., Chelsea, Mass.; Bouton, W. C., Waukegan, Ill.; Black, W. D., St. Louis, Mo.; Brobeck, A. L., Wellington, Ill.
Chicago Oxygen Gas Co., Chicago, Ill.; Clough, J. A., Pepin, Wis.; Cork, W. E., Seneca, N. Y.; Curry, E. M., St. Louis, Mo.
Derrick, Paul E., Advertising Agency, New York, N. Y.; De Young, R. J., Columbus, Ohio; Durham, Chas. E., Galveston, Texas.
Egan, J. A., Springfield, Ohio; Eshner, A. A., Philadelphia, Pa.; Everett, A. S., Brooklyn, N. Y.
Fletcher, W. B., Indianapolis, Ind.; Fischer, Louis, New York, N. Y.
Gillespie, T. W., Lostant, Ill.
Hare, H. A., Philadelphia, Pa.; Hunter, G. T., Denver, Colo.; Hilts, F., Kansas City, Mo.; Hall, H. L., Toledo, Ohio.
Inglis, David, Detroit, Mich.
Jarrett, H. S. Towson, Md.; Jones, P. M., San Francisco, Cal.
Keener, W. T., (2) Chicago, Ill.
Lukens, A., New York, N. Y.; Luttenberger, J. G. M., Dorchester, Ill.
Merrell Chemical Co., The Wm. S., Cincinnati, Ohio; Manitou Mineral Water Co., Manitou, Colo.; McKnight, W. B., Mansfield, Texas; Mellin's Food Co., Boston, Mass.
Nind, J. N., Chicago, Ill.
Paquin Laboratories, The Paul, St. Louis, Mo.; Parke, Davis & Co., Detroit, Mich.; Pasteur Vaccine Co., Chicago, Ill.; Platt, H. B., New York, N. Y.
Reed, C. A. L., Cincinnati, Ohio; Rixa, Alex., New York, N. Y.; Rosenthal, E., Philadelphia, Pa.
Smith, Kline & French Co., (2) Philadelphia, Pa.; Sharp & Dohme, New York, N. Y.; Senn, N., Chicago, Ill.; Stearns, F., & Co., Detroit, Mich.; Scott & Bowne, New York, N. Y.
Trout, E. H., Chicago, Ill.; Trader, E. J., Council, O. T.; Townsend, W. R., New York, N. Y.; Thurston, John, Louisville, Ky.
Willard, James, Lovettsville, Va.; Whitehead, E. J., Columbiana, Ohio; Wine, R. E., Quicksburg, Va.; Wingate, U. O. B., Milwaukee, Wis.; Whittemore, C. A., Grand Rapids, Mich.; Wherry, J. W., Chicago, Ill.; Warner, L. H., Brooklyn, N. Y.; Weaver, W. H., Chicago, Ill.; Williams, C. C., Los Angeles, Cal.